THE UNIVERSITY OF WASHINGTON

Arboretum bulletin

FALL 1968

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THE UNIVERSITY OF WASHINGTON

Arboretum bulletin

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TABLE OF CONTENTS

Arboretum Report; July 1, 1967—June 30, 1968 . . . . . B. O. Mulligan 50

Excess Soil Water and the Garden . . . . . Donald K. McClure 54

How to Grow Sunshine . . . . . Edwards R. Fish 55

In Czechoslovakia, Poland and Hungary; May-June, 1967 . . B. O. Mulligan 56

More on Latin Names of Plants . . . . . Harold William Rickett 62

Street Trees . . . . . W. H. Warren 65

Ceanothus 'Puget Blue' 68

New Members 69

Some of Our Favorites 70

Book Reviews 72

COVER PHOTO:

Clematis tangutica in fruit

PHOTO BY B. O. MULLIGAN

Arboretum Report; July 1, 1967 — June 30, 1968

B. O. Mulligan

1. *Improvements and Additions*

The most notable addition during the year was the Waterfront Trail, constructed from the Museum of History and Industry across Marsh Island to the north end of Foster's Island. Designed by Eric Hoyte, landscape architect for the University, the trail was financed by a grant of $45,000 from the U.S. Department of the Interior, Bureau of Outdoor Recreation, supplemented by funds from the Arboretum Improvement Trust Fund. The total cost was $108,870. One-half mile in length, it is built on a heavy timber frame filled with hog fuel capped with crushed rock, and winds through the cattails and willows, over two bridges floating on concrete pontoons. The popularity of this novel trail is quite evident both from the number of visitors to it and inquiries about it.

In the Japanese garden the long-awaited arbor was completed during the summer by the contractor, S. Ishimitsu, to plans originally drawn in Tokyo. This is located on the west side of the garden near the north end and provides a view to the lake through the cherry trees. The cost of it was borne by the Arboretum Foundation ($4,646).

Various improvement were made around the look-out above Azalea Way. During July 1967 rocks were placed and steps formed up the steep bank on its north side, previously more or less inaccessible; this was financed by the Memorial Fund of the Arboretum Foundation. In early spring new plantings were made immediately north and to the northwest of the structure, thus providing a more attractive setting for it and covering some bare areas.

A start was made in December in partially clearing the area between Foster's Island road and the lagoon to the west, with the ultimate intention of continuing the grass walk around the lagoon south and westwards.

2. *Other Maintenance Work*

During January the lindens, crab apples, hawthorns and some other groups were sprayed with dormant oil for the first time. In February, as usual, the spruces were likewise covered with Malathion for aphis. A heavy infestation of tent caterpillars required several sprayings during April and May with the same material, and in the latter month we also treated the hollies for leaf miner. In October and January the Japanese cherries received a covering of Microcop for wilt disease. Lime was applied to grass areas on heavy soil in November (3,000 lbs.), fertilizer on sandy soils (1,450 lbs.), Casoron for horsetail in nursery (100 lbs.) and elsewhere (Rhododendron Glen, Azalea Way, etc.). Fertilizer in spring to azaleas, rhododendrons, camellias.

Poplars were pruned along the Boulevard from Miller to Roanoke streets with a power hoist for first time. Considerable pruning was done by Y. Fukushima in the Japanese Garden from October-December, 1967.

3. *New Plantings*

Planting began early in October 1967 and continued with brief interruptions due to the weather or other causes to early June 1968. More than 1,000 plants were set out in those eight months, an increase of 300 over the previous year, due largely to the highly skilled crew of three doing this work. Nevertheless, much useful material remains in the nursery chiefly because of lack of space to place it in the Arboretum, a situation which cannot be rectified until additional land becomes available to us. We are, however, removing poor quality plants, especially amongst rhododendrons and camellias, and replacing them with better types. This process may have to be increased in the future and in other genera.

Amongst the plantings should be mentioned a group of large-leaved *Rhododen-*

dron species and hybrids on the bank north of the look-out, heathers in the Winter Garden, species of *Rosa* along the nursery road, new forms of Japanese maples and witch hazels (*Hamamelis*) in Woodland Garden, dwarf spruces beside Arboretum Drive E. in the magnolia area, and a small collection of dwarf conifers west of Azalea Way near the E. Lynn St. footbridge. On the bank beside the look-out are a number of different junipers and a short hedge composed of various forms of boxwood (*Buxus*). Many other small plantings have been made almost throughout the Arboretum, filling vacant places with appropriate plants.

4. *Acquisitions*

(a) *Plants and Scions*

662 lots were received in twelve months—purchased, donated or exchanged. Amongst the most interesting are a collection of eight kinds of heathers (*Erica*) given by Mr. William Steward, Maple Valley, Wash. and cuttings of eight forms of *Calluna* from Mr. W. H. Copeland, Cape Cod, Mass. From the University of Agriculture, Brno, Czechoslovakia, cuttings of nine kinds of willows (*Salix*); from the U.S. National Arboretum plants of four new crepe myrtles and three viburnums. Six new *Camellia* hybrids were purchased from a nursery in California with funds from Unit #54; four new types of *C. Sasanqua* were given to us by the Domoto Nursery, Hayward, Calif. Scions of a weeping European hornbeam came from the Jardin des Plantes, Paris; two species of poplar from Kornik Arboretum, Poland; a very attractive hybrid between the medlar and hawthorn from the Botanic Garden, Poznan, Poland, and four different forms of *Ginkgo* from the Holden Arboretum, Ohio. A collection of 33 kinds of woody plants, mostly from Korea, was received in April from U.S.D.A. Plant Introduction Garden, Glenn Dale, Md. Of special note are the five rhododendron plants purchased for us in March by the Arboretum Unit Council from the estate of the late Mrs. Blackford, Mercer Island.

(b) *Seeds*

301 packets received during the year, from many world-wide sources including the University of Chile, Santiago; from Mexico; Japan (9 species of *Acer* from a Forest Experiment Station near Tokyo, amongst others); the Tatra Mountains in Poland; Lapland; France; Ireland (6 species of *Abies* from the Earl of Rosse, Birr Castle); Leningrad, etc. Mr. J. Iida sent us a collection of eight kinds of Japanese trees from Tokyo.

(c) *Books*

The following are among the most useful or beautiful of the 69 new titles acquired:

1. *A Description of the Genus Pinus*
   By A. B. Lambert, 2 vols., 77 plates, (London, 1832)
   Gift of Arboretum Unit Council
2. *Camellia Trail*
   By E. G. Waterhouse (Sydney, Australia, 1952)
   Gift of Unit #8
3. *New Zealand Flowers and Plants in Colour*
   By J. T. Salmon (Auckland, 1963)
   Purchased from Arboretum funds
4. *The Rothschild Rhododendrons*
   By C. E. Lucas Phillips and Peter Barber (London, 1967)
   Gift of Arboretum Unit #8
5. *Wild Flowers of the United States*
   Edited by Dr. H. W. Rickett, vol. 2, parts 1-2 (New York Botanical Garden, 1966)
   Gift of Mr. & Mrs. H. C. Isaacson
6. *The Endemic Flora of Tasmania,* Part 1
   By Dr. W. Curtis, (London, 1967)
   From memorial funds of Arboretum Foundation

A collection of horticultural books was donated by Mr. & Mrs. Noble Hoggson, The Highlands, Seattle. Some also from the estate of the late Mrs. J. T. Dowling, together with two flower paintings. Approximately 80 volumes of our oldest and most valuable books were transferred to the Special Collections Division of the University Library during March, for safekeeping until our new building has been constructed.

(d) *Slide Collection*

This has grown considerably during the year, (by 295), due entirely to Mr. Witt's regular activities in this field. Fourteen pictures were taken from the air on Novem-

ber 14, 1967, with the aid of Mr. J. Wendell Trosper as pilot.

An experimental program of producing short motion pictures using the Super 8 format was started by Mr. Witt in 1967. To date a film about 10 minutes long showing the techniques of taking, rooting and potting summer cuttings has been finished and shown to various classes in plant propagation. It is planned to produce similar pictures showing other procedures of arboriculture, gardening, and Arboretum features in the future.

(e) *Other Gifts and Donations*

(I)	*From Arboretum Foundation and Arboretum Unit Council*	
	For: reprinting Blooming Calendar; signs on Waterfront Trail, steam sterilizer and cement mixer (January 1968)	$ 3,000.00
	Audio-visual equipment (February 1968) (SM8 Bolex projector)	750.00
	Ariens cultivator (March 1968)	1,500.00
	Fertilizer for lilac collection (April 1968)	127.00
(II)	*From Arboretum Foundation Units (July 1967)*	
	For various purposes, including Unit No. 41, $175.00 for any purpose	1,055.00
	Unit No. 45 (November 1967) for maintenance	250.00
	Unit No. 41 (May 1968) $200.00 for signs, and others	456.00
(III)	*From Friends of the Arboretum (December 1967)*	
	For Research Assistantship; Publications Fund, Travel and Professional Service, purchase of back hoe	9,000.00
(IV)	*From other sources*	
	Isaacson Corp. (July 1967), for improvements	1,000.00
	Estate of late O. E. Holmdahl (October 1967)	852.86
	Mrs. A. R. Kruckeberg (April 1968), from sale of plants, for fireproof filing cabinet	475.00
	Seattle Garden Club (May 1968), for Azalea Way	500.00
	Bloedel Foundation (May 1968), for Machiai in Japanese Garden	4,500.00
	Mercer Island Garden Club (June 1968), for Winter Garden	150.00
	Total:	$23,615.00

Plus many smaller contributions from garden clubs, Arboretum Units, and some individuals. Also the day's work contributed by numerous Unit members on April 24, 1968, under the leadership of Mrs. Jack Docter.

New Equipment

The following items were purchased from our regular Arboretum budget: a Parker Hurricane leaf blower with 6 h.p. engine; a Carmel fog dispenser, especially for use in the greenhouse; a National Triplex reel type 3-gang mower, 48 ins. wide, received in March.

Through the Arboretum Foundation or Unit Council we acquired a new 400 gallon John Bean sprayer with power take-off in March, and in the same month a concrete mixer with electric motor for mixing soils. In May an Ariens tiller with 9 h.p. engine for use in the nursery, and in June a Bolex SM8 projector capable of use with sound films. These major items of equipment are most acceptable and welcome here, where manpower is at a premium and we need all the mechanical aids we can utilize.

5. *Plant Material Distributed*

69 consignments of plants or scions sent out. 12 overseas, including cuttings of *Salix* (2 species) to University of Agriculture, Brno, Czechoslovakia; *Magnolia Kobus* 'Wada's Memory' to Bodnant and Caerhays Castle gardens. Great Britain; scions of *Acer macrophyllum* 'Seattle Sentinel' to a nursery in New Zealand, and of junipers and other plants to Sunningdale Nursery, England.

An exchange list of 31 young trees or shrubs was sent to other similar institutions in the U.S. and Canada in September 1967. 12 parcels were distributed as a result.*

In our annual international seed exchange, in which we offered 215 items on our list, we distributed fewer packets than last year, to fewer institutions, but still quite a large number (3,500 packets). The work involved in packeting and dispatching was again very competently done for us by members of Arboretum Unit No. 25, to whom we are always grateful.

The 56 plants sent to Echo Glen school near Preston were chiefly young trees, plus a few surplus rhododendrons and camellias. Almost all the 63 planted a year earlier have survived, including some pines of Mexican origin.

6. *Educational*

Mr. Witt led six two-hour walks in the Arboretum in October, February, March, April and May, concentrating on a different area each time.

Four pruning demonstrations were given by Mr. Narro in November, February, and March. Mr. van Klaveren, the nurseryman, shared four two-hour classes in Plant Propagation with Dr. Walker of the Botany Department in January, and in March gave two more classes in grafting techniques. All were well attended, particularly the propagation classes.

Both the Director and Mr. Witt took part in the Washington State Nurserymen's annual winter meeting in January, and were responsible for arranging and conducting two of the seminars in the series held in May by the College of Forest Resources on the general theme of Soil-Plant Relationships, one on Trees, the other on Shrubs and Groundcovers.

Other advisory work in which the Director and/or the Asst. Director have taken part included landscaping problems along the freeway for the State Highway Dept.; "Operation Triangle" planning with the responsible committee and the City Engineering Dept. in Seattle; the proposed development of arboreta at Western Washington State College, Bellingham, Grays Harbor Community College and Tacoma Community College.

The Director is a member of the Landscape and Architecture Committee of the Municipal Art Commission and takes part in their regular reviews of new public landscaping plans.

7. *Staff and Budget*

Mr. Y. Fukushima worked in the Japanese Garden from October 2-December 31, 1967. His salary was paid by Arboretum Foundation funds ($565 monthly). With other contributed funds we were able to employ an additional man—and sometimes two on a part-time basis—from mid May 1967 to January 1968. This year we are greatly handicapped in this respect by the University's new policy of deducting for indirect costs 40% of all amounts contributed from external sources for salaries or wages. (Indirect costs include services of Accounting, Payroll, Personnel and Purchasing offices; building maintenance, mail and telephone, etc.) At the moment we only have one man so employed two days a week and do not anticipate any more than this.

Proposed New Buildings

Considerable progress has been made by the architects, Ibsen Nelsen & Associates, with plans for the new administration building, to include an auditorium, library and herbarium, staff offices, classrooms and necessary auxiliary buildings for staff and equipment. However, these have not yet reached the point of working drawings or a contract for construction, although we are hopeful that this will not be delayed too far into 1969.

Weather and Flowering

This has been a most remarkable spring for profusion of bloom throughout the Arboretum, probably the best that we have ever experienced. Almost all trees and shrubs, with very few exceptions such as *Magnolia Sargentiana* var. *robusta*, have produced a far greater quantity of flowers than normal. It was perhaps especially noticeable in the cherries and crab apples, magnolias and rhododendrons, but also in other smaller, later flowering groups such as the *Cistus*, pyracanthas, *Styrax* species, and *Cornus Kousa*.

Undoubtedly this was due to the exceptional amount of sunshine received during five months last year (more than 1,600 hours from May through September) and we can only regret that it does not occur more often.

Excess Soil Water and the Garden

Donald K. McClure*

Without water, a garden is a desert. With xcess of this priceless ingredient, the situation is nearly as bad. To any gardener who has had to cope with excess water the extent of the problem is apparent. This article is not intended to cover swamp or marsh conditions, or any low-lying depression in which water collects and from which gravity removal is impossible. Such a site is cured only by extensive filling, which is generally impractical. Instead, the matters to follow will be directed toward land which is intermittently invaded by excess water, and from which this water may be removed or excluded.

The average gardener often fails to evaluate properly land which forms a part of a slope, with land of greater elevation adjoining it. Where this occurs, the depth of impermeable subsoil below the surface assumes great importance, much greater than is generally realized. The combination of slope, shallow natural surface soil, such trees as Oregon Ash or Swamp Willow and such weeds as Horsetail (*Equisetum*) are indications of trouble for the gardener during the wet season.

In such conditions, when the Fall rains commence and continue through Winter, more and more water will proceed down slope, by percolation below surface or by run-off at soil level. Being unable to permeate the subsoil, it will saturate the otherwise satisfactory surface soil. Obviously, it will leach out soil nutrients either natural or artificial. It will also seriously reduce the available root area for normal soil plants. On long range, the passage of water over or through the surface soil will in the one case expose roots through erosion or in the other produce the effect of a hydraulic fill. This tends to extend upward the impermeable subsoil and convert otherwise tillable soil into dense, unusable underlay.

Surface rooters, such as rhododendrons, particularly resent this condition. Roots in a soil area which becomes periodically saturated will die and be replaced by ones nearer the surface, where they are more vulnerable to winter freezing and summer drought. The effect of freezing on saturated soil is very severe. If a mulch is maintained the roots will energetically invade this, necessitating more mulching, and drawing the excess water even higher in a repetitive process.

The apparently obvious cures for the problems of soil moisture bear careful examination. When the writer first was faced with this problem, one suggestion from a competent source involved the drilling of ten to twelve inch holes to a sufficient depth to reach a gravel layer and at frequent intervals throughout the garden. This, data showed, might involve drilling to a depth of from thirty to thirty-five feet, and maintaining these holes open with crushed rock or gravel fill. The cost was prohibitive, and these drainage holes would have been just as efficient in running off precious summer applied water as they would have been in solving the wet season problem.

There is a very strong temptation to rid the garden of water by draining it through the garden area in gravel and tile runways, on the theory that this speeding of departure will solve the problem. In the writer's garden, this has not proved to be the case. It fails because the runways cannot be built or maintained at a sufficient flow capacity to care for a heavy runoff. Such a situation occurs at least once a year; the drains overfill and back up; and saturation or washouts occur. Once saturated in the fall, the soil has little chance in this climate to dry out to a healthy

*Mr. McClure is a long-time member of the Arboretum Foundation and of its Board of Directors. An ardent rhododendron enthusiast, a former article on recent rhododendron hybrids appeared in the Bulletin, Spring, 1965.

state until the following Spring. Drainage through the garden area also has the disadvantage of disposing of sprinkler water in the summer in an unintended fashion.

The feasible and efficient way to effect land drainage is to intercept and divert water before it reaches the garden area. To accomplish this, ditches should be dug along the more elevated boundaries extending both ways from the highest point. These ditches should be deep enough to reach the impervious subsoil. If this lies in folds, the depth of the ditch should reach the valleys and go below the peaks. Drain tile should be laid at the bottom of the ditch and the joints covered with building paper. The remainder of the ditch should be filled with coarse gravel to its top, and care should be taken to prevent any sealing of this top with soil or vegetation. If this is not done, water, in time of heavy run-off may pass over the ditch into the garden at the level of sealage. For aesthetic reasons this gravel surface is best placed along a boundary line and in conjunction with a fence, where its presence is least noticeable.

The ditches, of course, follow a line of gravity drainage on all sides of the area to be protected and ultimately terminate in an outfall of capacity completely adequate to absorb the runoff. This should be at the lowest point possible, and may involve a sump of adequate size. Here, it might be possible to utilize the drilling technique mentioned earlier to provide a connection between the sump and a subterranean drainage layer.

By way of caution and because all of us have neighbors, the final disposal of the water should be into what has always existed as a natural avenue of drainage. In this whole matter it is quite easy to exchange a horticultural problem for a legal one.

How To Grow Sunshine

Edwards R. Fish

Do you think the mid-winter darkness is too long in our Puget Sound climate? Do you feel as though you've been living under a spreading, leaky, sunless tent for the past couple of months? If so, get yourself a *Hamamelis mollis,* plant it in your yard, call it Chinese Witchhazel, and wait.

About next January the bare branches of your unpretentious little shrub will be apop with bright, spidery, yellow flowers, just when you most need the reassurance of some sunny color shining out against the dark background of our evergreen country. Cut a small branch, warm it in the house, and you'll have spicy-sweet fragrance to go with the color.

Nature will happily arrange pleasant surprises like this for us if we just pay attention and take a little time to help her make the necessary arrangements, like finding some comfortable, wholesome soil for roots to grow in. Locating a brightly-flowered shrub like the Witchhazel against a contrasting darker background helps, too, because that's the way it often happens in the natural order of things.

The Chinese Witchhazel's noiseless surprise, coming before the first peeping of tree frogs in early February, and only a few weeks after autumn's last leaves have blown away, actually leads the old season into the new. It is just another way of showing that in our temperate climate the seasons don't snap open and shut with the harsh precision they show elsewhere; here we don't ever really lose our contact with a time of growing and flowering. At least we don't if we have made a home for a *Hamamelis.*

Every tent should have one.

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*We are grateful to Mr. Fish of Issaquah, Washington for this delightful article.

In Czechoslovakia, Poland and Hungary, May-June, 1976

B. O. Mulligan

Introduction

My program following the Nitra meeting was to make two further visits in Czechoslovakia, at Opava and Brno, then proceed by air to Warsaw, Poland, where I would spend six days visiting several arboreta and botanical gardens in the company of Dr. K. Browicz of Kornik, near Poznan. Thence to Budapest, Hungary, for a similar four day program, May 28-31. Next by train to Zagreb, in northern Jugoslavia, for three days, en route to the International Dendrology Society's excursion and meeting during eleven days in southern Jugoslavia, starting and finishing at Dubrovnik.

The following account covers the portion from Czechoslovakia to Zagreb, May 18 to June 1, 1967.

Czechoslovakia

Following the Sympsium at Nitra* I spent a night in the Hotel Devin at Bratislava, almost on the Danube's bank, where in the morning I noted an admirable planting of a species of *Celtis* along the street, perhaps the native American hackberry, *C. occidentalis,* averaging about 25 ft. tall.

On Thursday, May 18, I was picked up by Mr. Ivan Musil, a member of the staff at Novy Dvur Arboretum, near Opava in northeastern Czechoslovakia to be driven there during the day via the spa of Piestany and the town of Trencin, our lunch stop, where I saw vigorous plants of Japanese cherries, hawthorn and lilacs along some of the streets (fig. 10), including the center strip. In Opava I stayed that night at the Orient Hotel, where one of the dining room staff fortunately spoke English.

Next morning Mr. Musil drove me out the short distance to the Arboretum, in company with the acting Director, Ing. M. Velicka, with Mrs. Kremanova, from the Silesian Museum of Fine Arts, to act as interpreter.

As in so many other instances in central Europe, the Arboretum had formerly been a private estate surrounding, in this instance, a solid stone house, but was now under state control. The earliest plantings dated back to about 1907 and included several North American trees such as the red and shingle oaks, tulip tree, black walnut, Colorado fir and Port Orford cedar (*Chamaecyparis Lawsoniana*).

A young tree of considerable interest was the purple leaved European oak, *Quercus Robur* 'Atropurpurea', 27-30 feet tall, which I had not seen previously. Of shrubs, a number of Rhododendron species were thriving (*R. canadense, R. hippophaeoides* and *R. racemosum*) as well as some hybrids of Czechoslovak origin, from Pruhonice, including 'Violetta' with rose pink flowers in compact heads, flowering profusely. A remarkable dwarf conifer of considerable age was *Picea Abies* 'Echiniformis', 3 feet high, 4 feet in width, with very short annual growths, (fig. 11).

A range of new greenhouses is being planned, to include one circular house 60 feet in diameter, 36 feet in height, leading to a long corridor from which four other rectangular houses will extend at right angles; one for sub-tropical plants, one for succulents, one for propagation and one for research purposes.

After lunch in Opava Mr. Musil, with a driver, very kindly took me by road to Brno, almost in the center of the country, in 2-1/2 hours, where I stayed in the modern Hotel International; the services, however, were hardly up to the appearance of the hotel.

On Saturday morning Ing. J. Chmelar, of the Faculty of Forestry, University of

*See *Arboretum Bulletin,* Winter; 1967.

Brno, with whom I had previously corresponded and exchanged material on the subject of willows (*Salix*), which he has been studying for a number of years, met me at the hotel with a car. He was first extremely helpful in obtaining confirmation of my flight reservation to Prague in the afternoon, as well as the necessary seat ticket (a fact unknown to me previously!), then took me to the small but well-kept Botanical Garden of the University of Agriculture (fig. 12), completely enclosed by buildings in the heart of the city, but yet maintaining a comprehensive collection of plants of all kinds from large trees down to alpine plants (collections of *Saxifraga* and *Sempervivum*, for example), many arranged in formal beds by families as usual. In several pre-war greenhouses there were also collections of tropical, sub-tropical, water, desert and special groups of plants such as begonias and orchids. Altogether it was an excellent example of what can be done even under very unsuitable and difficult conditions.

From there we went to the Botanic Garden and Arboretum of the University of Agriculture and Silviculture, containing the extensive collection of willows gathered from many parts of the world by Ing. Chmelar. Approximately 250 taxa are represented, from alpine species growing on a small rock garden to those of tree stature. I made notes of some which appeared to have distinct value for garden decoration, and in November, through the generous cooperation of Mr. Chmelar, we received cuttings of eight different kinds, most of which in due course we hope will become established here to evaluate their local horticultural potential.

After lunch in a restaurant on a hillside overlooking the city we drove to the airport for my afternoon 'plane to Prague, the overnight stop on the way to Warsaw, again at the Alcron Hotel.

Lilacs and hawthorns (*Crataegus Oxycantha* forms) used as street trees in Trencin, Czechoslovakia.
Fig. 10—Photo by: B. O. Mulligan

Poland

Next day, the 21st, I left Prague in a four-engined jet at 3:25 p.m. and was in Warsaw forty five minutes later, a distance of about 370 miles. There I was met by Dr. Browicz and his sister, as well as a representative of the State travel bureau, Orbis, which provided a car for the 15-20 minutes' drive into the city. The first part of this is along a boulevard lined for several miles with linden trees of two or three kinds which in a few years' time when they are larger will form a very handsome avenue. Why do we not sometimes do the same in this country?

I had a room at the Grand Hotel for two nights but, although of recent construction, this was by no means of the same calibre as the Alcron in Prague.

That evening we enjoyed a diversion from matters botanical or horticultural in a performance at the new Opera House of a 19th century Polish opera, *The Haunted House,* well staged, dressed and lighted, with almost a full house.

The Opera House took 15 years to build, was completed in 1965-66, and is magnificently finished and decorated, with marble in the foyer and on the walls and staircases. No one who visits Warsaw should fail to see it; there is also a theater adjacent of the same recent date. The citizens can be justly proud of these splendid edifices built by their own efforts and workers, and now used and enjoyed by them.

Monday, the 22nd, was principally occupied with a visit by car to the 100 acre Forest Arboretum of the Warsaw College of Agriculture, located at Rogow, about 70 miles S.W. of Warsaw; the Director is Mr. W. Levicki, whom we met on arrival and with whom we later enjoyed lunch in his office.

I was much impressed by the thorough methods of keeping plant records and planting data. There is first an entry book for acquisitions, then separate planting cards (about 9 x 12 ins.) to show locations in the

Picea Abies 'Echiniformis', at Arboretum Novy Dvur, Opava, Czechoslovakia.
Fig. 11—Photo by: B. O. Mulligan

Arboretum. A map on the office wall indicates location and dimensions of each plot, which vary in size and shape. For each species there is a separate sheet to show all sources of material and when planted. Plot labels are of metal, about 7 x 9 inches, enamelled white with black letters fired on, giving names in Polish and Latin and the country of origin; they are mounted on metal stakes 18 inches above the ground.

Some of the forest plots were planted prior to the last war and fortunately survived; e.g. Douglas fir and *Thuja plicata,* the former 60-70 feet high, said to be the best for their age in Poland. (Larger trees were seen at Goluchow a few days later, but these were twice as old). Many more species have been planted post war, and most are thriving, particularly from local seed sources; e.g. *Pinus Strobus, P. contorta,* (from several sources in the U.S.A.), *P. Peuce* from S.E. Europe, *Picea jezoensis* var. *hondoensis, P. orientalis, Abies sibirica, Tsuga caroliniana,* and the hybrid larch *Larix x eurolepsis.*

A few maples are grown in small quantities, including our western *Acer glabrum;* some other trees of interest included the handsome *Populus lasiocarpa* and *P. Wilsonii* (both from Kornik Arboretum) which we unfortunately lack; the maple-like *Kalopanax pictus* and *Betula davurica* with its peeling bark, both from N.E. Asia; a weeping form of the wild European cherry, *Prunus avium 'Pendula',* while the native hornbeam, *Carpinus Betulus,* was common in the woodlands. The climate however, was proving too severe for the dove tree, *Davidia involucrata,* although it had reached 8-9 feet in height.

Rogow also possesses a small rock garden or alpinarium of the mound type, with several pools, constructed and still maintained by Ing. Henrick Eder, retired assistant professor of Forest Botany, who was also responsible for the reconstruction of

Botanical Garden of the University of Agriculture, Brno, Czechoslovakia.
Fig. 12—Photo by: B. O. Mulligan

the Arboretum following the last war and accompanied us on our tour.

On the return journey we visited Chopin's birthplace, Zelaslova Wola, and walked through the small, well-preserved house and grounds, where the lilacs were in full bloom. These shrubs are frequently planted and generally seem to flourish in central European countries.

On the following day Dr. Browicz first took me to the Botanical Garden of the University of Warsaw, another well kept and interesting old garden in a city, like that in Brno. The Director, whom we met first, is Mrs. Karpokowska; another English-speaking lady member of the staff showed us around the ten acres, first planted more than a century ago. Some of the largest remaining trees, including a *Ginkgo* about 30 inches d.b.h., a hornbeam (*Carpinus Betulus*) 36 inches, *Quercus Robur,* the American bur oak (*Q. macrocarpa*), a Kentucky coffee tree (*Gymnocladus dioicus*) and a Siberian crab apple (*Malus baccata*) must date from that period. The garden is divided about equally between beds of plants of particular kinds (e.g. medicinal plants), or from special habitats (e.g. bogs, sand dunes), and an arboretum. There are also several glasshouses similar to those at Brno for non-hardy plants A new one was being constructed to house surplus material.

That evening we left Warsaw by an express electric train for Poznan, 186 miles westwards. The journey, with two stops, took 220 minutes. The country is quite flat between the two cities. In Poznan I stayed three nights in Dr. & Mrs. Browicz's apartment, a courtesy which I greatly appreciated.

May 25th was the day reserved for visiting the world famous arboretum at Kornik, which I had long anticipated as being one of the peaks of the entire tour; I was not to be disappointed. The research Institute and Arboretum, belonging to the Polish Academy of Sciences, is about twelve miles S.W. of Poznan and covers 1,400 acres of land, of which the arboretum occupies 87 acres. The director is Prof. Stefan Bialobok, whom I had already met earlier in Czechoslovakia. Besides Dr. Browicz, Dr. W. Bugala, an authority on the genus *Populus,* accompanied me round this extremely interesting place. Some of the older trees were planted more than a century ago by a former owner of Kornik Castle, which still stands and contains a fine collection of art objects gathered by him. Examples are the silver maples *(Acer saccharinum),* red oak (*Quercus rubra*), honey locust (*Gleditsia triacanthos*), and swamp cypress (*Taxodium distichum*)—all from the U.S.A. —and the London plane (*Platanus x acerifolia*) and white poplar (*Populus alba*) from Europe, the latter the largest example I have ever seen.

Amongst younger specimens were several *Aesculus* species, notably *A. turbinata* from Japan and *A. neglecta* from North Carolina; the beautiful white trunked *Betula Jacquemontiana* from the western Himalaya; the shagbark hickory, *Carya ovata,* and the two Chinese *Populus* species seen at Rogow—*P. lasiocarpa* and *P. Wilsonii*—with their large and decorative leaves. *Tilia* species are also very well represented.

The lilac collection comprises about 150 clones, most of which were in bloom at this date and making a fine display. Two prominent species I noted were *S. Josikaea,* the Hungarian lilac, perhaps twelve feet high, and the northern Chinese *S. Meyeri,* much lower but flowering equally profusely. A hedge of the single flowered rose hybrids 'Fruhlingsmorgen' and 'Fruhlingsgold' interplanted was an unusual and effective feature behind the administration building-laboratory. This contains staff offices, a biochemistry laboratory, library and herbarium, and in the basement plant growth chambers with controlled ventilation, light and temperature, the last a facility which we also hope to have in our own arboretum before too long. A new administration building was under construction at the time of my visit.

Two days later I paid a second visit to Kornik and saw the seed orchards of vari-

ous selected tree species in the company of Prof. Bialobok. These are of black alder (*Alnus glutinosa*), European ash (*Fraxinus excelsior*), European and Polish larches (*Larix decidua* and *L. polonica*), Norway spruce and Scots pine. Of the last, 40 clones were planted in 1964. Nearby are other plots of the same pine, planted in 1967 in rows 3 feet apart, from 32 different sources in Poland. The arboretum propagates plants for sale as well as for their own use; nursery and experimental grounds cover 32 acres, so there is ample space available for all purposes.

The next morning, the 25th, was spent in the University of Poznan Botanic Garden, which is 13-14 acres in size and apparently contains no trees older than about 40 years. There were some unusual specimens nevertheless, including an *Acer* labelled *A. laxiflorum*, a species very rare in cultivation, *Quercus Frainetto* from S. Italy and the Balkan Peninsula, and the remarkable and unusual graft hybrid *Crataegomespilus Dardari* var. *Asnieresii*, in full bloom resembling a large hawthorn or *Sorbus*. Of this we later obtained scions through the assistance of Dr. Browicz, and plants are now growing here. This was a good example of discovering an unusual plant in an unexpected place, as occasionally happens on such tours. One section of the garden has a sand dune planting (the soil is naturally quite sandy), another of plants found in the steppes, another contains shrubs from different areas of the world, e.g. China, Manchuria, N. America, etc. There is also a rock garden on which *Pinus mugo* predominates. The labels are generally of metal with embossed letters, fastened to iron stakes.

On the following day we had a car and driver provided by the Institute to take us to the arboretum at Goluchow, approximately 60 miles S.E. of Poznan. This also was founded in the 19th century by the same owner of Kornik castle and contains many of the same trees, such as red and pin oaks, hickories, firs and swamp cypress. Douglas firs are now 80-105 ft tall after 80 years; there is a superb specimen of *Picea orientalis* about 75 feet tall, the largest in Poland, while the Siberian spruce, *P. obovata*, has reached 50 feet. The soil is evidently deep and of good quality to produce such excellent trees. The most important feature of the arboretum is the landscape design, the work of an amateur owner and not of any professional. Trees were first planted for shelter and background, then in large irregular groups with long valleys or slopes of grass between them, and an artificial lake at one end near the castle. Considerable care was evidently taken to allow vistas from selected points, although some of these have now become narrow owing to the growth of the trees.

The landscaped portion merges into extensive woods of beech, hornbeam and oak, and beyond that to a mixed plantation of conifers; trees are plentiful but the number of species is small. The arboretum is owned by the College of Agriculture in Poznan, but most unfortunately little maintenance seems to be done, no improvements are being made, and what might be one of the finest arboretums in Poland is being seriously neglected. Dr. B. Sekowski was in charge and escorted us round the former estate.

On Saturday, May 27, I was due to depart for Budapest, Hungary. Dr. Browicz again took me to the Poznan airport by car to see me off, thus terminating almost a week of the utmost help and kindness to me, especially in transportation and housing, which made my stay in Poland most pleasant and certainly enlightening.

Hungary

This flight took me back to Warsaw, where I had to wait from about midday to 7:00 p.m. to get another to Budapest, which takes about 90 minutes in a four-engined 'plane. I had a reservation at the Hotel Royal, which can be recommended and seems to be patronized by many nationalities.

Sunday was to be a day of rest, and having somewhere acquired a severe cold

(*Continued on page 76*)

More on Latin Namer of Plants*

By Harold William Rickett

Recently I wrote a piece (this Journal, January-February 1967, page 38) about the botanical or Latin names of plants. I pointed out the simplicity of botanical nomenclature, and showed that many who are afraid of it are actually using it for the names of genera.

Genera (plural of genus) are the "kinds" of plants in a broad sense: all the roses are a genus, all the lilies another; each is named by a single word, as *Rosa, Lilium.* Many of these names are in common use by gardeners and nurserymen; they need no further exposition here.

Within a genus we find species; their names are made of the genus-name (called the generic name) plus a second word: *Rosa gallica, Lilium tigrinum, Viola pedata.* Such names may indeed—in the current neglect by the schools of the Latin background of our language—dismay the intellectually timid or slothful. Yet the second word—known as a specific epithet—has meaning, often evident to anyone who will really look at it. Most specific epithets are Latin adjectives, or Latinized Greek adjectives, often descriptive of some characteristic by which one distinguishes the species. Others commemorate some collector or botanist.

A complete dictionary of these words cannot be given here (Aside from the Latin dictionaries, William T. Stearn of the British Museum has lately given us a volume entitled *Botanical Latin* [Hafner Publishing Company, New York, 1966, $16.75] in which an extensive vocabulary is provided.) But it is possible to list and explain even in this brief compass a number of epithets that occur over and over again, attached to different generic names. To become familiar with these is to take the first large step in the knowledge and appreciation of the international language of botany. It is not difficult.

The Endings of Latin Words

First a note on the endings of Latin words. They change with number and gender—niceties that the English language lost long ago. (We still, however, distinguish the masculine "actor" from the feminine "actress," and the nominative "I" from the accusative "me.") A Latin adjective changes its gender to fit that of the generic name to which it is attached. Most adjectives that concern us here end in *-us* or *-er* (masculine), *-a* (feminine), *-um* (neuter); or in *-is* for masculine and feminine and *-e* for neuter; a few endings in *-or* or *-ns* do not change endings with gender. So we write *Helianthus annuus* and *Helianthus occidentalis, Viola palmata* and *Viola canadensis, Lilium philadelphicum and Lilium canadense.* The form of the generic name usually gives us the gender; even when this is not true (e.g., *Quercus alba),* the reference books supply the example to be followed. In what follows, all adjectives are listed in the masculine.

Epithets Made from Names of Persons

Many epithets are made from the names of persons—the first collector of a species or someone in some way responsible for its classification. The person is transformed into a citizen of ancient Rome by the addition to his name of *-ius* or *-us,* or *-ia* if it is a lady: Torreyus, Nuttallius, even Rickettius. The noun thus made appears generally in the genitive (possessive) case: *Lobelia nuttallii* (Nuttall's lobelia), *Triphora rickettii* (Rickett's triphora), *Eupatorium luciae-brauniae* (Lucy Braun's eupatorium). Or the name may acquire an adjectival ending: *Viola brittoniana* (literally the Brittonian violet, i.e. named for N. L. Britton).

Compound-word Epithets

Many specific epithets are compound words which join a descriptive adjective

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21ST ANNUAL ARBORETUM FOUNDATION
UNIT COUNCIL PLANT SALE
ARBORETUM
WEDNESDAY – OCTOBER 2, 1968 – 9:00 A.M.

BONSAI

JUNIPERS – Communis Compressa
– Procumbens
PINES – Aristata
– Mugho Pumilio and Pumila
– Pentaphyllum
SPRUCE – Alberti
– "Birdsnest"
RHODODENDRONS
– Impeditum
– Radicans

And in addition, a selected assortment of Ilex, Dwarf Conifers, and deciduous material suitable for Bonsai.

BULBS

Choice varieties of ALLIUM, BRODIAEA, CALOCHORTUS, CAMASSIA, CHINODOXA, CROCUS, CYCLAMEN, ERANTHIS, ERYTHRONIUM, FRITILLARIA, GALANTHUS, LEUCOJUM, IRIS, IXIAS, IXIOLIRION, MUSCARI, NARCISSUS, PUSCHKINIA, SANGUINARIA, SCILLA, SPARAXIS, TRILLIUM, TULIPA, TRITELEIA. Special list with prices for advance orders will be sent on request. Call EAst 5-4510 or write--Arboretum Foundation, o/o University of Washington Arboretum, Seattle, 98105.

FERNS

ADIANTUM PEDATUM – Maidenhair – feathery foliage on dark stalk to 18".
ASPLENIUM TRICHOMANES – Maidenhair Spleenwort – a small to large rock fern.
BLECHNUM SPICANT – Deer Fern – narrow evergreen fronds.
CHEILANTHES GRACILLIMA – Lace Fern –
C. DENSA – small rock fern.
CRYPTOGRAMMA CRISPA ACROSTICHOIDES – Parsley Fern – small rock fern.
DRYOPTERIS IZETTA MARIE – Wood fern hybrid.
PELLAEA ATROPURPUREA – Purple Cliffbrake – small stiff evergreen rock fern.
PHYLLITIS SCOLOPENDRIUM – Hart's Tongue.
POLYSTICHUM MUNITUM – Western Sword Fern-Large, evergreen.
P. ANGULOR – Coarse evergreen fern.

GROUNDCOVERS

AETHIONEMA – Stonecress-perennial choice little shrublet.
ANDROMEDA POLIFOLIA – everg. to 1' flrs. pink May-July.
ANDROSACE LANGUINOSA – Rock Jasmine lvs. silky gray flrs. rose May.
ARCTOSTAPHYLOS MEDIA – everg. semi-prostrate shrub to 1'.
A. UVA-URSI – Kinnikinnick native prostrate everg. flrs. white to pink.
ARMERIA SAPHOLUTUS RUBRA – Thrift or sea pink everg. globular flrs.
BERBERIS BUXIFOLIA NANA – dwarf barberry everg. lvs. spiny flrs. orange-yellow.
BUXUS MICROPHYLLA NANA COMPACTA – very dwarf box everg. compact.
CEANOTHUS GLORIOSUS – Point Reyes Creeper shrubby mat like flrs. lavender blue.
COTONEASTER DAMMERI – everg. trailing flrs. white May-June red fruits.
C. LOFAST – very hardy low and fast growing-Hopkins cross.
C. MICROPHYLLA COCHLEATA – everg. prostrate molds to ground hardy.
C. SALDAM – spreading fast growing everg. bright red berries.
C. TOM THUMB – everg. most prostrate variety-red berries.
CYTISUS (GENESTA) DECUMBENS – prostrate broom creeping to 8" flrs. yellow.
C. HUMIFUSA – dwarf broom very low spreading flrs. yellow.
C. LYDIA – cushion forming dwarf 2-3' across flrs. bright yellow May-June.
EPIGAEA ASIATICA – Trailing Arbutus similar to repens-reported easier to grow.
EPIMEDIUM PINK – low growing nearly everg.
E. VERSICOLOR SULPHUREUM – hardy perennial to 12" flrs. yellow.
EUONYMUS FORTUNEI 'KEWENSIS' – trailing climbing very small lvs.
E. FORTUNEI VARIEGATA – trailing everg. variegated lvs.
E. PATENS 'DUPONT' – everg. compact fast growing dark green lvs.
GALAX APHYLLA – hardy everg. lvs. glossy vermillion to green flrs. white June.
GAYLUSSACIA BRACHYCERA – Box Huckelberry everg. to 18" flrs. white or pink.
GAULTHERIA CUNEATA – everg. to 12" flrs. white June-July fruits white.
G. HUMIFUSA – everg. to 4" flrs. white fruits scarlet.
G. ITOANA – everg. to 6-7" flrs. white fruits white or pink sun Hardy.
G. MIQUELIANA – everg. to 6-12" flrs. white fruits white.
G. NUMMULARIOIDES – everg. fern like lvs. flrs. white or pinkish.
G. OVATIFOLIA – spreading everg. to 1' flrs. white fruits scarlet.

G. SINENSIS – from China everg. creeping flrs. white.

GENTIANA ACAULIS – Stemless Gentian low to 4" flrs. dark blue lvs. dark green.

GLOBULARIA NANA – plant mat like flrs. globe shaped lavender blue.

HEBE (VERONICA) BUXIFOLIA – stiff everg. flrs. white late summer box like lvs.

H. CUPRESSOIDES NANA – everg. slow to 5" cypress like lvs.

H. CLAUCOPHYLLA – everg. broad rounded compact flrs. white dense clusters.

HEPATICA TRILOBA – anenome like to 4-6" flrs. lavender blue early spring.

HEUCHERA RED PIMPERNAL – Coral Bells everg. flrs. bell shaped scalloped lvs.

ILEX CRENATA HELLERI – everg. dwarf compact black fruits.

LEIOPHYLLUM BUXIFOLIUM – Sand Myrtle everg. to 18" flrs. pink to white.

LITHODORA DIFFUSA 'GRACE WARD' – lithospermum selected good form and color.

MAHONIA NERVOSA – everg. native to 2-3' lvs. glossy toothed flrs. yellow.

MUEHLENBAECKIA AXILLARIS – Wire Plant very low, twiggy deciduous.

PACHISTIMA CANYBI – dwarf everg. mat 9-12" dark green narrow lvs.

PACHYSANDRA TERMINALIS – hardy everg. flrs. white spikes dark green lvs.

PENSTEMON – perennial everg. shrublets in variety of colors.

PIMELEA COARCTATA – Australian Daphne everg. flrs. white lvs. gray compact.

PHLOX NIVALIS – trailing flrs. pink or white clusters narrow everg. lvs.

POLYGALA VAYREDIAE – Milkwort choice rock garden plant flrs. orchid like.

PYROLA BRACTEATA – leathery glossy lvs. flrs. like lily-of-valley fragrant.

SANTOLINA CHAMAECYPARISSUS – many branched flrs. yellow globose gray-white lvs.

SEDUM SPECTABILE – succulent upright spreading flrs. pink lvs. blue-green.

SHORTIA GALACIFOLIA – Oconee Bells perennial to 6" flrs. white lvs. glossy.

THYMUS – (thyme) perennial herbs scented Wooly, red colored form and white colored form.

VACCINIUM OVATUM – native everg. to 2-3' flrs. white or pinkish fruits black.

VIBURNUM DAVIDII – everg. white flrs. to 3' lvs. dark green veined.

V. OPULUS NANUM – dwarf cranberry bush to 2' decid. red fall color.

VINCA MINOR 'BOWLES BLUE' – form with exceptionally fine blue flrs.

V.M. FLORA PLENA – dwarf periwinkle everg. trailing.

V.M. FLORA PLENA – red form.

V.M. FLORA PLENA – white form.

WALDSTEINIA FRAGARIOIDES – strawberry like foliage flrs. yellow agressive.

HEATHS & HEATHERS

Many varieties of CALLUNA, ERICA, DABOECIA –summer and winter blooming. FALSE HEATHERS, CASSIOPE, PHYLLODACES.

HERBS

Culinary: BUSH BASIL, FENNEL, POT MARJORAM, THYME, TERRAGON, FRENCH SORREL, SALAD BURNET. Also aromatics: MINT, LAVENDER, CHIVE and SAGE.

JAPANESE GARDEN MATERIAL – A list of suitable materials and departments in which they can be bought will be at the Education Table.

NATIVES

ARBUTUS MENZESII (Madrona)

CORNUS CANADENSIS (Creeping Dogwood, or Bunchberry).

CORNUS NUTTALLII

CORNUS STOLONIFERA (Red Osier).

THUJA PLICATA (Western Red Cedar).

TRILLIUM OVATUM (Western Trillium).

TOLMIEA MENZIESII (Youth-On-Age).

Many other items in quantities too limited to list.

PERENNIALS

Pacific Hybrid DELPHINIUM, pink, white, light blue and dark blue, MONKSHOOD, purple blue, GYPSOPHILA (Bristol Fairy, Baby Breath), SHASTA DAISY, Ester Reed and Chiffon, border CHRYSANTHEMUMS, TRITOMA (Red Hot Poker) red and yellow, MICHAELMAS DAISY, blue-gray, rose pink and white, CORAL BELLS, LONDON PRIDE, PRIMROSES, RUSSELL LUPINES, ASTILBE, white, pink and red, AQUILEGIA (Columbine) HELLEBORE, IRIS, in variety, JAPANESE ANEMONE, pink and white.

TREES & SHRUBS

ACER CAPILLIPES – Maple – to 40', leaves bright green summer, deep crimson fall.
- A. DAVIDII – beautiful species to 35' yellow and purple in fall.
- A. GINNALA – deciduous 6-20' – graceful – good fall color.
- A. PALMATUM ATRO-PURPUREUM – Upright habit.
- A.P. DISSECTUM – (seedlings) slow-growing, 20'.
- A. RUFINERVE – to 30'–deciduous–bright fall color.

ALBIZZIA JULIBRISSIN –Silk Tree – decid. rapid growth to 40' – Fls. pink.

ARBUTUS UNEDO – Strawberry Tree – fine lge. evergreen, small white fls. – red frts.
- A.U. COMPACTA – smaller, bushier form of Strawberry Tree, frts. early.

ARCTOSTAPHYLOS HOOKERI – Native – shrubby – fls. pinkish – Feb.-April.

BERBERIS VERRUCULOSA – Everg. 3-4', lvs. glossy, frts. black.

CALLICARPA DICHOTOMA – Beauty Berry – decid. to 6' – pea-sized, pinkish-violet frts. in fall.

CALLISTEMON SPECIOSUS – Bottle Brush Tree–fls. rich red with yellow antlers.

CAMELLIA AKEOBONO – Rose pink semi-dbl. flowers.
- C. AUBURN WHITE – very large – semi-double white fls.
- C. DONATION – J.C. Williams Hybrid–fls. deep pink.
- C. DONCKE LARII – Red marbled white – large semi-double.
- C. FINLANDIA – large double white fls.
- C. GRANDIFLORA ROSEA – deep pink – lge. semi-double.
- C. LOTUS – very large semi-double white fls. water lily form.
- C. MARY CHRISTIAN – J.C. Williams cross – deep pink single.
- C. MASQUERADE – white striped pink – lge. semi-double.
- C. PINK PERFECTION – shell pink-sml. formal double.
- C. STRYKER'S CATY – large pink semi-dble.

CAMELLIA SASANQUA BENI-KUROTSUBAKI – black-red with red stamens.
- C.S. CLEOPATRA – rose pink – semi-double peony form.
- C.S. COTTON CANDY – clear pink – large semi-double with ruffled petals.
- C.S. JEAN WILCOX – large white.
- C.S. MINE-NO-YUKI – white-large peony form.

CARYOPTERIS –hardy blue spirea – low to 24" fls. powdery blue, fringed.

CEANOTHUS IMPRESSUS – fast growing to 10'-many deep blue fls.
- C.I. PUGET BLUE – everg. upright 8-9' fls. gentian blue-Apr.
- C. OLYMPIC LAKE – new arboretum form low spreading to 2' fls. blue spring.
- C. SIERRA BLUE – erect 6-10' fls. deep, pure blue in great profusion.

CERCIS SILLIQUASTRUM – Judas Tree – decid. to 25'–fls. purplish lvs. lge. heart-shaped.

CHAMAECYPARIS LAWSONIANA FLETCHERI-everg. 6-8' – blue-gray.
- C. OBTUSA – everg. to 50' spreading dark glossy green lvs.
- C. PISIFERA NANA AURA – dwarf-variegated golden foliage.

CHOISYA TERNATA–everg. 6-8' fls. white clusters spring lvs. yellow-green.

CHRYSOLARIX AMABILIS – Golden Larch-decid. 40-70' foliage feathery bluish green gldn. in fall

CORNUS KOUSA – decid. to 25' fls. bracts creamy white-May-June.
- C.K. CHINENSIS – decid. 25' fls. bracts creamy-white-May-June.
- C. MAS – decid. to 10' fls. yellow clusters Feb.-Mar. scarlet frt.

CUPRESSUS SEMPERVIRENS – upright to 40'–columnar fastigate habit.

DAPHNE ODORA – everg. spread 4' fls. pink fragrant clusters - spring.

ELAEAGNUS PUNGENS VARIEGATA – yellow edge-everg. large sprawling.

EMBOTHRIUM COCCINEUM LONGIFOLIUM – everg. fls. crimson scarlet May-June.

ENKIANTHUS CAMPANULATUS – decid. 10-15' fls. loose clusters luminous apricot Apr-May.
- E. PERULATUS –fls. small white Apr. most brilliant fall color.

EUCALYPTUS CINEREA – 20-50' almost as wide-lvs. gray-green – fls. small Winter-Spring.

EUCRYPHIA NYMANSENSIS – everg. to 15' fls. white summer - lvs. Lustrous.

EUONYMUS ALATA MONTROSA – same as E. Compacta but bigger with heavy corky ridges.
- E. PATENS DUPONT – everg. compact fast-growing lvs. dark green.

EUPHORBIA WULFENII – everg. 3-4' fls. chartreuse yellow umbles-very handsome.

FATSHEDERA LIZEL – hybrid fatsia & hedea-

FATSIA JAPONICA – everg. 5-8' lvs. bold, glossy dark green fan-like.

FORSYTHIA INTERMEDIA KARL SAX – decid. graceful fls. yellow Feb.-Apr.

FRANKLINIA ALATAMAHA (GORDONIA) – decid. small tree cup-shaped white fls.-Fall.

GINKGO BILOBA – Maidenhair tree interesting foliage shape golden in fall.

GLEDITSIA TRIACANTHOS SUNBURST – Sunburst Locust-handsome specimen-showy golden green foliage.

HALESIA CAROLINA – Silverbell tree decid. to 30' silver bells in clusters-May.

HYDRANGEA QUERCIFOLIA – to 6' fls. creamy-white, June-Sept. lvs. crimson in fall.

ILEX AQUIFOLIUM VARIEGATA – English Holly with creamy edge.
- I. CRENATA CONVEXA – slow growing rd. lvs. black berries.
- I.C. HELLERI – everg. compact frt. black.
- I. MYRTIFOLIA – large shrub or small tree frt. typically red.

JUNIPERUS VIRGINIANA – Grey Owl – everg. spreading to 8' very gray foliage.

KOELREUTERIA PANICULATA – decid. to 30' fls. yellow 14' panicles July-Aug.

LAURUS NOBILIS – Sweet Bay – everg. to 40' lvs. 4" aromatic used in seasoning.

LEUCOTHOE FONTANESIANA – everg. to 6' arching, fls. small white bells-Apr. May.

VINES

CLEMATIS – Over 35 varieties will be available.

ARMANDII – Pink
– White
BARBARA DIBLEY – Pansy Violet
BELLE OF WOKING – Double Mauve
COMTESSE DE BOUCHARD – Pink
CRIMSON KING – Red
DANIEL DERONDA – Purple Blue
DAVIDIANA – Dwarf Purple
DUCHESS OF ALBANY – Pink Bell
DUCHESS OF EDINBURGH – Double White
DURANDII – Violet Blue
EDITH CAVELL – White with Green Bar
ERNEST MARKHAM – Red
GIPSY QUEEN – Velvety Purple
HENRYI – White
HULDINE – White
JACKMANII SUPERBA – Purple
JACKMANI ALBA – White
KING EDWARD 7th – Large Purple-Blue
LADY BETTY BALFOUR – Purple
LANUGINOSA CANDIDA – White
LASURSTERN – Blue
LORD NEVILLE – Plum with Red Bar
MADAME EDOUARD ANDRE – Red
MARIE BOISSELOT – White
MME. BARON VIELLARD – Lilac Rose
MONTANA – Pink Perfection – Pink
MRS. CHOLMONDELEY – Blue
MRS. SPENCER CASTLE – Orchid Pink
NELLY MOSER – Mauve Pink with Red Bar
PANICULATA – Creamy White
PINK CHIFFON – Pink
PRINZ HENDRIK – Azure Blue
RAMONA – Blue
THE PRESIDENT – Violet Blue
VILLE DE LYON – Carmine Red

Other Ornamental Vines: PASSIFLORA – Passion Vine; BIGNONIA – Trumpet Vine; HYDRANGEA PETIOLARIS – LONICERA SEMPERVIRENS – LONICERA MAGNIFICA – Trumpet Honeysuckles; WISTERIA – Purple, Pink and White.

ORDERS will gladly be taken in advance. MAIL orders to Joy Spurr, 6076-52nd Ave. South, Seattle, 98118.

RHODODENDRONS AND AZALEAS

SPECIES

ABERCONWAYII – white to rose, spotted
ARIZELUM – white to yellow, indumentum
AUGUSTINII – blue, upright to 6-10'
A. var Caprice – deep blue
A. var Lacamas Blue P.A.
AURICULATUM – late, white, scented
BRACHYANTHUM VAR. HYPOLEDIDOTUM – greenish yellow
BAUHINIIFLORUM – upright to 9' yellow
CAMPANULATUM – blue, 8-10'
CAROLINIANUM – pink, low, very hardy
CILIATUM – early, pale pink, 2-3'
CONCATENANS – apricot, fine foliage
CRASSUM – large white, scented 4'
DAVIDSONIANUM – upright to 10' pale pink
DISCOLOR – very late, pink to white
EXIMIUM – pink, fine foliage, indumentum
EXQUISITUM – mauve-pink, blue-green lvs.
DEGRONIANUM – pink, good foliage
GYMNOCARPUM – crimson, fawn indumentum
HEMITRICHOTUM – semi-dwarf, pink
HODGSONII – large leaves, indumentum
JOHNSTONEANUM – white to yellow, tender
IMPEDITUM – dwarf, purplish blue
INTRICATUM – dwarf, lilac blue
KELETICUM – dwarf, purplish crimson
KEYSII – tall, unusual flrs. red to orange
KYAWI – crimson, greenhouse shrub
LACTEUM – yellow, indumentum, rare
LANIGERUM – rose purple, indumentum
LEUCASPIS – white, very early, low
LUTESCENS – early yellow, bronze foliage
MAKINOI – pink, narrow lvs. 3'
METTERNICHII – rose indumentum, low
PEMAKOENSE – early, low, pinkish lilac
PSEUDOANTHINUM – reddish purple, 3-8'
PUBESCENS – pink to white, low
RACEMOSUM – pink, profuse bloom, low
RADICANS – prostrate, purple flrs.
REX – white or rose, large lvs. indumentum
SALUENENSE – semi-dwarf, reddish flrs.
SINOGRANDE – large lvs. silvery indumentum
UNIFLORUM – compact dwarf, lilac pink
WARDII – shades of yellow, glossy lvs.
WILLIAMSIANUM – pink, low, spreading
WILTONII – white to pink, fine foliage
YAKUSIMANUM – pink to white, low
YUNNANENSE – tall, white to lilac pink

HYBRIDS

Albatross
Alice
Anna
Anna Rose Whitney
Azor
Beauty of Littleworth
Bric-a-brac
Blue Diamond
Bowbells
Blood Ruby
Carita
Cilipense-pink
C.I.S.
Clara Weyerhauser
Cotton Candy
Conemaugh
Cowslip
Cream Crest
Creeping Jenny
Day Dream
Devonshire Cream
Diane Titcomb
Dora Amateis
Elizabeth
Edward Dunn
Emasculin
Francis Hanger
Gold Mohur
Grande X Macabeanum
Grosclaude
Helene Schiffner
Jaipur
Jane Rogers
John Coutts
Honeymoon
King of Shrubs
Lamplighter
Leo
Little Gem
Loder's White
Lucky Strike
Lucy Lou
Maricee
Margaret Dunn V.
Golden Belle
May Day
Mrs. Betty Robertson
Mrs. Donald Graham
Mrs. G.W. Leak
Mrs. Henry Agnew X
Falconeri
Moonstone
Naomi X Williamsianum
Nectarine
Nugget X Naomi Exbury
Olive
Olympic Lady
Patricia
Phyllis Ballard
Queen of Hearts
Quaver
Red Cloud
Reve Rose
Rosamundi
Rose Elf
Ruby Hart
Sappho
Seattle Gold
Snow Lady
Tessa
Thalia
The Hon. Jean
Marie De Montague
Thor
Treasure
Unique
Vanessa
Vanessa Pastel
Van Ness Sensation
Virginia Richards
Wendy
White Lily
White Swan
Xanthocodon X
Lady Roseberry
Yellow Hammer

AZALEADENDRONS: Broughtonii Aureum, Glory of Littleworth
DECIDUOUS SPECIES: mucronulatum, occidentale, prunifolium and quinquefolium
DECIDUOUS AZALEAS: Berry Rose, Cecile, Homebush, Marina, and Oxydol

EVERGREEN AZALEAS

Coral Bells
Everest
Garda Joy
James Gable
Hakatashiro
Helen Close
Hiroshimo
Moonbeam
Mrs. L.C. Fischer
Niagara
Oldhami
Rosebud
Seigetsu
Shinny-No-Tsuki
Treasure
Twenty Grand
Ward's Ruby
White Squall

LEYCESTERIA FORMOSA – to 6' graceful, fls. long dark purple bracts late summer red-purple frt.

LIQUIDAMBAR STYRICIFLUA – Sweet Gum – decid. to 80' fine fall color.

MAGNOLIA GRANDIFLORA ST. MARY'S – everg. superior form fls. fragrant early.

MAHONIA AQUIFOLIUM COMPACTA – same as type but more compact.

M. LOMARIIFOLIA – everg. bamboo-like – handsome fls. spikes of rich yellow Oct. Nov.

MYRICA CAROLINIENSIS – Bayberry – to 9' lvs. dark green gray berries.

NANDINA DOMESTICA – everg. to 8' fls. white panicles June-July frt. red.

OSMANTHUS FORTUNEI SAN JOSE – to 20' lvs. oval hollylike fls. cream to orange Oct.

O. ILICIFOLIUS – everg. to 18' fls. fragrant clusters June-July.

OXYDENDRUM ARBOREUM – Sorrel Tree decid. to 70' terminal sprays white fls. late.

PACHISTIMA MYRSINITES – everg. native 2-4' purplish or greenish fls. Apr.-June.

PALM CHAMAEROPS EXCELSA – hardy palm withstands very cold winters.

PERNETTYA MUCRONATA – everg. 3' pollenizer for berries pink or red.

PHORMIUM TENAX ATROPURPUREUM – everg. display or container plant lvs. used in flower arranging.

PHOTINIA FRASERI – everg. to 12' new promising hybrid foliage shining.

P. GLABRA – everg. to 12' can be pruned to 2-3'.

PICEA PUNGENS GLAUCA KOSTER – 80-100' pyramid bluest of needles.

PIERIS FORRESTII – everg. upright 6-10' fls. small whitish fragrant spring.

P. JAPONICA – Lily-of-the Valley shrub – clusters pearly white fls. early spring.

P. JAPONICA CRISPA – similar to P. Japonica with wavy edged lvs.

P.J. NANA – Miniature to 3" spreads to 6" bell-shaped white fls.

PINUS ARISTATA – Low shrubby short needles sprinkled white.

P. CEMBROIDES – 10-25' stout form needles dark green.

P. DENSIFLORA UMBRACULIFERA – Bushy 6-7' table-like shrub bearing minute cones white quite small.

P. MUGO PUMILIO – Fine Dwarf – good for rockeries.

P. NIGRA – To 40' dense needles very dark green – use as specimen or windbreak.

PUNICA GRANATUM – Decid. fls. showy – lvs. bright green to golden.

RAPHIOLEPIS OVATA – Everg. 3-4' fls. soft pink loose spikes May to frost.

RHUS COTINUS COGGYGARIA – Decid. fls. pink upright panicles lvs. yellow-orange fall.

R.C.C. PURPUREA – purple Smoke Tree – Dark Red lvs.

R. TYPHINA – Staghorn Sumac Decid. 15-30' fls. Greenish June-July.

SAROCOCOCCA HOOKERIANA – everg. to 6' fls. fragrant white small winter.

S.H. HUMILIS – everg. to 12" fls. white inconspicuous Oct. Mar.

SCIADOPITYS VERTICILLATA – Umbrella Pine distinctive needles bronzy green whorls.

SKIMMIA JAPONICA – everg. 2-3' fls Apr. May frts. white all winter (red form also).

STEWARTIA PSEUDOCAMELLIA – to 40' decid, fls. white anthers orange July-Aug.

STRANVAESIA DAVIDIANA – everg. wide spreading fls. white frts. showy red.

S.D. UNDULATA – everg. prostrate fls. white June frt. coral-red to orange Oct. Nov.

STYRAX JAPONICA – decid. 30' fls. pendulous white June-July.

TAXODIUM MUCRONATUM – decid. or everg. 40-75' weeping branches-graceful.

TERNSTROEMIA JAPONICA – everg. fls. and frt. white. Dark Green lvs.

TROCHODENDRON ARALIODES – everg. to 30' fls. bright green in racemes.

TSUGA CANADENSIS PENDULA – pendulous hemlock mound-like spreading form.

VIBURNUM TINUS – Laurustinus – everg. 6-12' fls. clusters pink buds open white Nov.-Spring.

V. TOMENTOSUM – decid. 12' flat white flower trussed upperside of branches.

SPECIAL ORDERS

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2840-40th West
Seattle, Washington 98199
AT 3-1765

OR

MRS. J. ORRIN VINING
4116-94th S.E.
Mercer Island, Washington 98040
AD 2-5320

REMOVE THIS SECTION AND BRING IT WITH YOU TO THE SALE!

or a numerical prefix to the name of some part of a plant. Se we have *brevicaulis*, from *brevi-* (short), and *caulis* (stem): "short-stemmed." *Brevisepalus* means "with short sepals"; and *flexicaulis*, "with bent stem." Learning the meanings of some of the comparatively few words that make such compounds unlocks the significance of hundreds of botanical epithets. Here they are:

Descriptive Adjectives

albi- and Greek *leuco-*, white.
angusti-, narrow.
brevi-, short
flexi-, bent or flexuous.
grandi-, large.
lati-, broad.
longi-, long.
macro-, large or long.
multi-, many.
parvi-, small.
pauci-, few.
rotundi-, round.
sessili-, sitting, i.e. without a stalk.
tenui-, slender.

Numerical Prefixes

uni- and Greek *mono-*, one.
bi- and Greek *di-*, two.
tri-, three.
quadri- and Greek *tetra-*, four.
quinque- and Greek *penta-*, five.
a- (Greek particle), without.

Parts of a Plant

caulis, stem.
carpus (Greek *karpos*), fruit.
flos, (*-florus*) and Greek *anthos*, flower(s).
folium and Greek *phyllon*, leaf.
pes, foot, i.e. stalk.
petalum, petal.
sepalum, sepal.

With the above tenuous linguistic equipment such epithets as *longifolius, quinquefolius, microcarpus, acaulis, sessiliflorus, pauciflorus, latifolius, longipes, leucanthus* should have no terrors.

Geographical Epithets

A second group of epithets are obviously geographical, referring either to the region where a species is abundant or (more commonly) to the place where it was first discovered. *Lilium philadelphicum* is not confined to Philadelphia, but was first observed near there. *Iris missouriensis*, common in the western United States, was discovered near the headwaters of the Missouri River. *Astragalus arizonicus* is abundant in Arizona.

Many of these words are simply state or country names that have been given Latin endings; they require no translation: *americanus, arizonicus, arkansanus, californicus, danus, illinoensis, marilandicus, mexicanus, missouriensis, ohioensis (ohiensis), pensylcanadensis, carolinianus (caroliniensis), florivanicus, philadelphicus, texanus (texensis), virginianus (virginicus, virginiensis).* Similar words, of course, describe states or countries or areas in the Old World: *anglicus, chinensis (sinensis), indicus, sibiricus, suecicus.*

Pensylvanicus is so spelled (in most plant names) partly because Pennsylvania was also often written with the single "n" in early times, partly because in Latinizing such a name as "Penn" it was customary to reduce the double letter to one. A few geographic words may not be at once recognizable: *novaeangliae,* genitive case of *Nova Anglia* (New England); *ludovicianus* (of Louisiana, Ludovic being Ludwig or Louis); the town of York in Roman Britain was Eboracum—New York is therefore *Novum Eboracum* or *Noveboracum,* whence *noveboracensis.*

Besides the above more or less precise terms, several words are more general in their indication: *australis* (southern); *borealis* and *septentrionalis* (northern); *occidentalis* (western); *orientalis* (eastern).

The very common adjectives *canadensis* and *missouriensis* must not be interpreted in their modern sense. Many species labeled *canadensis* occur widely through the United States; when they were named, "Canada" meant almost every place west of the Appalachians. Similarly, *missouriensis* often referred to the vast territory watered by the Missouri River. Even "Louisiana" was often taken to include most of the country west of the Mississippi, as "upper Louisiana."

Words That Describe the Sort of Place Where Plants Grow

aquaticus, aquatilis, in water *(aqua).*
arenicola, on sand *(arena); -cola* means "inhabitant" and does not change ending with gender or number; compare *saxicola.*
arvensis, in fields *(arva).*
campestris, in plains *(campi).*
maritimus, by the sea *(mare).*
montanus, in mountains *(montes).*
palustris, in swamps *(paludes).*
pratensis, in meadows *(prata).*

riparius, on river banks *(ripae).*
sativus, cultivated
saxicola, on rocks *(saxa);* compare *arenicola.*
sylvestris, sylvaticus, in woods *(sylvae);* strictly, should be *silvestris, silvaticus,* but medieval Latin was not classical.

Words That Designate Color

albidus, albus, white.
atropurpureus, dark purple, almost black *(ater).*
aureus, golden.
azureus, blue.
bicolor, with two colors.
canescens, whitish or becoming whitish (usually with white hairs).
coccineus, scarlet.
concolor, the same color on both sides (of a leaf).
cyaneus, blue.
discolor, with different colors on both sides (of a leaf).
flavus, flavulus, yellow.
fulvus, tawny.
glaucus, whitish with a bloom.
luteus, yellow.
maculatus, spotted.
niger, black.
pallidus, pale.
purpureus, purple; the classical purple was what we call crimson; botanists still use the word in the classical sense.
roseus, rose.
ruber, red.
sanguineus, blood-red.
viridis, viridescens, green, becoming green.
violaceus, violet.

Words That Describe the Shapes and Margins of Leaves

acuminatus, tapering (with concave sides) to a point.
acutus, sharp-pointed.
amplexicaulis, embracing the stem.
angustifolius, with narrow leaves.
bifidus, cleft into two.
cordatus, cordifolius, heart-shaped, i.e. indented at the base; the heart is upside-down.
ellipticus, elliptic.
incisus, incised; deeply cut into sharp teeth.
integer, integerrimus, entire, i.e. the margins without teeth or notches.
laciniatus, deeply cut, jagged.
lanceolatus, narrow, pointed, broadest between middle and base.
latifolius, with broad leaves.
linearis, narrow with parallel sides.
linifolius, with leaves like those of *Linum,* flax.
ob-, upside-down; e.g. *obovatus,* ovate with the broader part outward; but *obtusus,* blunt.
ovalifolius, with oval leaves; sides parallel, ends round.
ovatus, ovate, egg-shaped; broadest between middle and base.
palmatus, divided or lobed with parts extending from a common central part or point.
perfoliatus, the stem growing through *(per)* the leaf or pair of joined leaves *(folia).*
pinnatifidus, pinnately cleft but not divided to the midrib.
pinnatus, divided or cleft or lobed into parts arranged along the sides of a central part or midrib.
renifolius, with kidney-shaped leaves.
reniformis, kidney-shaped, i.e. broader than long, with an indentation at the point of attachment.
rotundifolius, with round leaves.
sagittifolius, with arrowhead-shaped leaves.
serratus, saw-toothed, the teeth pointing forward.
sinuatus, with edges curving in and out.
tenuifolius, with narrow leaves.
trifidus, cleft into three.
undulatus, with wavy margins.

Words That Describe the Surfaces of Leaves and Stems

asper, rough.
barbatus, bearded, i.e. with a tuft of long hairs.
ciliatus, fringed with hairs.
glaber, smooth.
hirsutus, hirsute; with coarse hairs.
hirtellus, with coarse but short hairs.
hispidus, bristly.
horridus, horridulus, prickly.
laevis, smooth.
lanatus, lanuginosus, lanulosus, woolly.
mollis, soft (with soft hairs).
pilosus, with long hairs.
pubescens, downy.
scaber, scaberrimus, rough, very rough.
tomentosus, with short tangled hairs.
villosus, shaggy with long hairs.

Words That Describe General Appearance and Manner of Growth

acaulis, without (visible) stem.
bulbosus, growing from or possessing a bulb or bulbs.
erectus, standing erect.
frondosus, leafy.
fruticosus, shrubby.
gracilis, slender.
humilis, low.
nudicaulis, with nude, i.e. leafless, stem.
procumbens, bent down and trailing.
prostratus, lying on the ground.

(Continued on page 68)

Street Trees

W. H. Warren*

In preparing this talk I've tried to condense almost forty years experience with trees into a few pages. But this body of experience means very little when we consider the selection of trees. We are constantly on the lookout for better and more adaptable street trees. A new annual is bred, tested and marketed in a few years. It may take a lifetime or more to do the same thing with trees. Today, select clones of certain trees are being recommended for street planting, and this is a good thing, a big step forward, but in many cases even these exhibit faults, because we have not had time to fully evaluate them. So we are ever searching for the best tree. The accumulated knowledge or know-how comes exceedingly slowly.

Why plant trees on streets? The objective 50 or 75 years ago used to be to use a fast growing tree for shade and screen. Today our prime objective is for aesthetic appearances. Shade value has been downgraded, but there is a greater appreciation of their ability to provide a sound barrier, and to improve the environment. We know that they have the ability not only to absorb and utilize CO_2 from the air, but carbon monoxide as well.

Tree planting is a useful modern tool in rejuvenating blighted residential and downtown areas.

What are the qualities we are looking for in a street tree?

Vigour—to withstand alien urban environment and vandalism,

Branching habit—usually upright and suitable to the site.

Adaptability. Trees are required which will adapt themselves well to varying sites, soils and other conditions, including resistance to exhaust fumes and wind.

Resistance to disease and insects.

Character of flower and foliage. Small leaves are desirable.

Good fruiting habit. Example: horse-chestnut—poor.

Good root characteristics. Example: surface and buttress roots on horse chestnuts break sidewalks.

Costs. A tree which has good qualities as enumerated, is also economical to maintain. No tree has all these requirements. A poor tree may cost five or six times as much to maintain and present no better appearance on the street. Spacing should be aimed to get the maximum effect for the minimum number of trees. Close spacing, except for special purposes, may be wasteful. A classic example of an attractive tree costly to maintain is the English hawthorn.

Space and position. 25′ to 60′ depending on species and site. In Victoria we commonly use a spacing of 45′ to 50′ but in some downtown sites we go down to 25′ to 30′. If there is a choice of planting between sidewalk and curb or between sidewalk and property line, choose the latter. The tree will receive less vandalism and more personal attention from the property owner if it grows inside of the sidewalk.

Space—sidewalk to curb—minimum width five feet.

Curb to tree—minimum four feet.

If planted in sidewalk—minimum width of sidewalk eleven feet.

Clearance required over sidewalk—eight feet; over roadway—fourteen feet.

Size of tree. Theoretically, the smaller the tree the quicker it establishes. On streets, forget it. A two, three or four inch standard tree with a six or eight foot stem is used for one purpose only—to withstand public abuse. Losses in smaller sizes will run 5% per year and up, due to vandalism.

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*Parks Administrator, Victoria, B.C. Talk given at Seminar on *Factors in Environmental Planning in Western Washington,* May 23, 1968, at University of Washington, Seattle.

Tree holes. Simply said, the bigger the hole the more success you are likely to have.

Planting. I wish I knew all the answers here. If you dig a hole in clay and bring in loam for the hole you may be in trouble with soil moisture problems—even wet feet. An open loam soil to get good root aeration is desirable. Anything wet which compacts easily is undesirable. A compromise has to be worked out. An excess of peat or leaf mould may be harmful. There appears to be little advantage to adding fertilizer at planting time. It may induce rank growth causing a top-heavy condition on weak standards.

For water purposes Los Angeles has designed four 4″ tiles going into the ground to a depth of three feet, offset about one foot from each corner of a 4′ x 4′ hole. These are filled with 3/4″ gravel.

We plant from early February on. Fall planted trees are too subject to wind and desiccation. It is important that the tree be well stabilized so it does not blow around.

Watering. Trees should not be allowed to desiccate. They can easily be injured by over-watering if planted in impervious material. By the time the injury becomes apparent, the tree is usually in a state beyond recovery.

Position of tree. Mark a position for each tree clear of all underground services, utilizing plans of underground services on the spot. In residential areas we like to plant trees opposite the boundary fences on the lots, but find we are competing for these positions with utility companies. There is much to be said for planting of trees in staggered fashion down the street, because of the screen effect it creates for the residents. We often do this even where two kinds of trees are used on one street, though the planting appears more formal if trees of each variety are planted opposite one another. Do not worry if conditions are such that planting distances must vary slightly. It will be scarcely noticeable when the trees grow up.

A certain set-back must be made at intersections, crossings, fire hydrants, etc. I notice Seattle has good basic standards for this, copies of which are available from the Public Works Department.

Ordering Stock. Trees of the size previously specified are hard to get. It may be desirable to grow one's own or place orders in the sizes required for advance delivery. But some commitment is also desirable on the part of the nurseryman. I have been let down a number of times by nurserymen, who for one reason or another, failed to make good on advance orders.

Downtown Planting in Sidewalks. Details re tree spacing have already been mentioned and the need for tree selections which will withstand air pollutants.

Treeholes 4′ x 4′ are standard, but not less than 3′ x 4′. Surfacing around the trees with brick is expensive and seldom satisfactory because of settlement. We are now using a concrete slab cast in two sections with a cutout for the tree in each slab. Each slab sits on a concrete ledge around the edge of the tree hole. If settlement occurs it isn't apparent and there is ample space for air and water under the slab. Of course you can use cast iron grilling but this is too costly for most of us.

If one should err at all in selecting trees it should be toward trees of robust vigour and size. Small growing trees have little chance of success under such adverse conditions.

In 1958 Mr. Ross McIntyre of Los Angeles wrote a very good paper on this subject, "Planting Trees in Downtown and Business Districts," and Seattle has done a tremendous amount of basic research and planning over the past few years on a tree planting programme.

Selection of Material. This is extremely important. First of all, I think we must scan the material which already does well in an area, bearing in mind local conditions of soil, climate, vandalism, width of street, height of overhead wires and the susceptibility of the tree to pests, etc. Then select a tree of the size, character and vigour, suitable for the job, but not a size which

will grow so large as to cause future trouble. Now I wish to digress for a minute to illustrate a point.

Victoria and most other cities, 75 years or so ago, planted trees which grew quickly and without regard to quantity or quality. Quick results were the objective. Then came a painful period of trouble with overhead, underground and surface installations. We adopted a policy, over 35 years ago, of removing the worst offenders and replacing them with smaller types of trees. Here we also had difficulty, because few could advise correctly on what to use. Some trees we tried had insufficient vigour. Now insufficient vigour, ordinary wear and tear on streets, plus vandalism, can bring conditions to a point where you may lose trees faster than you can grow and plant them, so it is extremely important to use the right material.

It is difficult to suggest what is best, because one's views only apply to one's own area. Do not plant trees which require constant pruning and attention. plant trees which will grow to their natural height without hindrance. This will help to hold maintenance costs to a minimum.

It is emphasized that an accurate knowledge of local conditions is required. Secondly a sound practical understanding of the good points and limitations of each species should be known as far as possible, before selecting trees for street planting. For instance, under some conditions, regular watering of the newly planted trees is essential the first season and for several years thereafter, in order to get them established.

NOTES ON STREET TREES IN VICTORIA

Black Locust—Robinia pseudoacacia

+No leaf problem, vigorous, attractive tall tree, drought resistant and adaptable as to soil. A tree of good form and the sun filters through the thin foliage.

–Seeds freely, subject to wind damage, but not badly here, surface rooting, may sucker.

Birch—Betula alba—common European type

+Attractive. No problem of leaf disposal.

—Hard to establish in young stages, particularly under conditions of drought. Branchlets drop in winter storms, a minor nuisance.

Birch—cut leaf

Not recommended, low vitality in young stages and subject to attack from sucking insects, with honey dew and sooty mould.

Birch—Paper—Betula papyrifera

+More vigorous and fewer problems

Flowering Ash—Fraxinus ornus—one of the best, a small tree. Select male form.

+Adaptable to soil, fairly drought resistant. Leaves fall quickly in the fall. Summer flowering, robust, good form and habit.

—No obvious faults.

Red Flowering Horse Chestnut—*Aesculus carnea Briotii and Aesculus carnea,* pink form Horse Chestnut

+Smaller in habit than the common Horse Chestnut and less vigorous.

—Fruits objectionable, but these are smaller and fewer than in common Horse Chestnut.

Double forms of English May or Hawthorn —Crataegus Oxyacantha vars.

+These are popular because of their attractive flowers, often with a good show of fall color and fruit. Trees moderate in size.

—They are not an easy tree to grow and hence are costlier to maintain than most street trees. They do not form good root systems and may require staking. Wide spacing in the nursery may be helpful. Very susceptible to insect pests, particularly aphis and scale. This may present less of a problem in future due to development of systemic insecticides. Aphis cause honey dew and sooty mould. Not recommended.

Purple-leafed flowering Plum—Prunus cerasifera 'Pissardii'

+A tree with dark foliage of good habit and form, which is very adaptable as to soil. It flowers freely every year without

(*Continued on page 73*)

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To keep membership in the Arboretum Foundation in good standing, dues should be paid during the month payable. Active memberships more than three months in arrears will be dropped and The Bulletin will be discontinued.

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Ceanothus 'Puget Blue'

A friend used to send out invitations every spring in honor of her *Clematis Jackmani.* It was worth toasting in champagne with its rich violet-purple flowers covering one side of the house and roof.

We feel like doing the same this year with 'Puget Blue' *Ceanothus* the honor guest.

Not that it is so startlingly beautiful yet, but we have had it quite a long time (after losing its predecessor in a freeze) and had thought it never would bloom. Now it is bursting forth shyly, but the potential is there. We can hardly wait for it to be like one along a fence in Medina, which spills its beauty into the eyes of passersby.

I first met 'P. B.' *Ceanothus* at the Arboretum and it was love at first sight. A great one, more like a tree than a shrub, grew outside the office as high as the roof and covering two windows.

Eventually, in a high wind, 'P. B.' blew over and was finished. It was a good thing it happened that way says an Arboretum employe, because "anyone who dug it up would have had to fight me."

Ceanothus, a member of the blackthorn family, comes in light blue, white or pink panicles but 'P. B.'s flowers are a deep, deep blue. It was grown from seed at the Arboretum and named by someone with an aptness for the right handle. It is the color of Puget Sound, of the Mediterranean, of the sky sometimes and of the eyes of a good sealpoint Siamese cat.

From Dorothy Brant Brazier's column—Seattle Times, June 3, 1968, reprinted with kind permission of the author and the Times.

More Latin Names of Plants

(*Continued from page 64*)

pumilus, dwarf.
ramosus, branching.
repens, reptans, creeping. (Compare "reptile.")
rigidus, stiff.
scandens, climbing.
strictus, straight, erect.
tenellus, tenuis, slender.

tuberosus, growing from or forming a tuber or tubers.

Words That Denote Various Attributes

alternifolius, having "alternate" leaves, i.e. leaves borne singly.
annuus, annual; growing from seed to flower in one season.
aromaticus, aromatic.
autumnalis, flowering in autumn.
biennis, biennial; forming leaves the first season of growth, flowers the second.
capillaris, hairlike; very slender.
cernuus, "nodding" or drooping.
citriodorus, having the odor of citrus.
communis, common.
cristatus, crested.
elongatus, elongated.
filiformis, threadlike.
fimbriatus, fringed, i.e. the edges cut into narrow teeth.
gramineus, graminifolius, like a grass (gramen), with grasslike leaves.
heterophyllus, with leaves of different forms or colors.
inflatus, inflated; expanded, with space inside.
nutans, "nodding" or drooping.
officinalis, "of the shops," i.e. used commercially.
pachypodus, with thick stalks.
perennis, perennial; growing and flowering through successive years.
pulchellus, beautiful.
rugosus, wrinkled.
sempervirens, evergreen.
sessilifolius, -florus, with leaves, flowers, lacking stalks.
setaceus, bristle-like.
spectabilis, handsome, showy.
squarrosus, "rough," i.e. having the tips of leaves, bracts, etc., bent out and down.
striatus, marked with lines.
suaveolens, sweet-smelling.
tinctorius, used in dyeing.
vernus, flowering in spring.
vulgaris, common.

This is your Arboretum, kept alive by your support

We are pleased to welcome the following new members March 18 through August 23, 1968: *Sponsor*—Mr. & Mrs. Albert Moss. *Contributing*—Erle W. Horswill, Mrs. P. D. Koon, Thomas J Owens, Mrs. Josef C. Phillips. *Sustaining*—Esther H. Burton, Allen I. Campbell, Dr. & Mrs. Gordon J. Carlson, Mrs. C. E. Casady, Dr. Almon S. Fish, Jr., Mrs. Carl J. Frank, James A. Henry, Troy E. Himmelman, Mrs. Gordon L. Jacobsen, G. Paul Kelty, Mrs. Irene A. Klevens, Clark B. Malmo, Isaac Namioka, Dr. & Mrs. James Nelson, Mrs. Alfred J. Neuharth, Mr. & Mrs. Will Schweitzer, Winston Scott, Kenneth W. Smith, Mrs. Richard L. Spore, Mr. & Mrs. Olav Ulland, Mr. & Mrs. Leon A. Uziel, Mrs. R. E. Walker. *Annual*—Mrs. Gilbert Anderson, Mrs. Kenneth L. Anderson, Mrs. Vernon Archer, Elizabeth Ayer, Mrs. John Backland, C. Richard Ballard, Mr. & Mrs. Byron C. Baxter, Christopher T. Bayley, C. Bergquist, Mrs. Richard H. Beuthel, Mrs. Robert E. Brown, Mrs. Henry S. Burkson, Mrs. W. H. Chappell, Donald L. Davis, Frederick F. Davis, Mrs. A. B. C. Dawson, Betty V. Day, Mrs. V. de Salvatore, Mrs. Roll N. Dillon, Mrs. Darrell Dobson, Mrs. E. E. Eldredge, Mrs. George E. Fahey, Mrs. G. L. Foote, Mrs. Gene R. Freeburg, Mrs. Gordon G. Gallup, Mrs. Robert P. Geivett, Mrs. Harry Green, Mrs. James H. Green, Mrs. Vernon Hall, K. L. Hassenmiller, Mrs. David E. Howard, J. L. Humphrey, Mrs. Roy E. Jackson, Mr. & Mrs. Harold R. Johnson, Bernice Jonson, Mrs. Lytle P. Lindberg, Mrs. Herbert S. Little, Mrs. Jules B. Maassen, Mrs. M. J. MacPherson, Mrs. John B. McNaughton, Jr., Ernest A. Michael, Mrs. Lew R. Micklesen, Mrs. Paul J. Monroe, Mrs. J. E. Opheim, Virginia Parker, Mrs. Russell W. Post, Milo E. Powell, Mrs. Edmund W. Pugh, Jr., Mrs. Buryln C. Raabe, Mrs. O. K. Roberts, Mrs. Ralph K. Roof, Mrs. W. Lennox Scott, Frank Seberg, Carletta A. Shanahan, Mrs. Harry M. Simmons, Mrs. John P. Stephens, Mrs. Harvey Stivers, W. Ewart G. Suffel, Mrs. John F. Sullivan, John N. Sylvester, Mrs. Archie Taft, Jr., Mr. & Mrs. Robert C. Talbert, Mrs. Robert M. Thatcher, Mrs. Ronald Tocantins, Howard Tuttle, Mrs. Victor R. Tvrdy, University of British Columbia, Mrs. Arthur H. Van de Kamp, Ernest H. Yelton, M.D., Mrs. Vito C. Zilinskas. We are also grateful to the following who have increased their membership dues to: Life—Mrs. Roland Pinkham. *Sponsor*—Dr. & Mrs. Richard Fuller. *Contributing*—Mrs. Evan S. McCord, Mrs. T. A. Wilson. *Sustaining*—Ethel Christoffers, Mrs. Sheffield Phelps, Dr. Roland Pinkham, Mrs. Jack H. Whitesel.

Some of Our Favorites ☆

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We Like Bulbs

There IS room for a few "little" bulbs in your garden! Where? Put them at the foot of a shrub, in a planter, in a pocket of the rockery, by your doorstep, or where you can see them as you do the dishes or telephone. Why? Because they add color and interest to the winter garden and give a spiritual lift to a grey winter day.

Because my yard is a small city lot, I have turned to miniatures, but many of them would be suitable for a larger yard. It is a real joy to gaze out the window on a cold, grey, damp January morning to discover that *Crocus Imperati* has opened it's buff buds to reveal a pretty violet flower, and nearby the buds of *Crocus chrysanthus 'E. P. Bowles'* are buttery yellow. How nice to be welcomed home on a dark evening by *C. c. 'Snowbunting'* glowing fresh and white in the porchlight. These early little gems reflect and complement the colors of the winter blooming heathers.

As February comes, even more crocus are in bloom and are joined by the fragrant *Iris reticulata* in its various named forms of purples and blues. *Iris danfordiae* is a bright yellow, usually in bloom by the first.

One of the daintiest of daffodils is usually on hand to greet February. *Narcissus minimus (asturiensis)* is a fragrant, 3-inch high beauty with a perfect trumpet, 1 inch long. It is followed soon by tiny golden *N. cyclamineus.*

As March commences, so do the tulips. It begins with the gay, giddy species *Greggii* and *Kaufmanniana* and their hybrids. The colors are yellow, rose, salmon and red; the foliage is gray-green with chocolate blotches. The names are enticing – *'Red Ridinghood,' 'Dreamboat,' 'Oratorio.'* Another early tulip is *T. pulchella violacea,* a globe of purple the color of grape jelly with the sun shining through. If the sun should shine, it opens wide and shows a bright yellow star at its center.

With the advent of spring, there is a succession of tiny crocus, narcissus, and tulips blooming before their larger hybrid offspring. Among my favorites are *Crocus chrysanthus 'Goldilocks'* and *'Princess Beatrix.'* The sweet scented jonquil narcissi are special favorites—from dime-size, 4 inch, *N. rupicola* to the tall double *N. campernellii odorus plenus* that blooms about March first. The soft yellow, *N. 'W. P. Milner'* and the chaste, drooping bells of *N. triandrus albus* are pleasing among the brighter colors. My first species tulip is still my favorite—*T. Clusiana,* the peppermint-stripe tulip. Other favorites are the bronze and yellow *T. chrysantha, T. Batalinii*—a late yellow tea cup that gets taller as it gets older, the glorious scarlet *T. linifolia,* and the old rose *T. Aucheriana.* Then there is the little, low *Tulipa tarda* that is 'just nothing' until the sun comes out and it opens its golden cups.

As one becomes enchanted by bulbs, the closely related rhizomes of the anemones (*blanda, apennina,* and St. Brigid), the erythroniums, cammasias and the fritillarias are worthy of a try. Each has its own charm and place in the garden.

The most important single requirement of bulbs is good drainage. They need the winter rain, but standing water is fatal. I plant my smallest bulbs in 4-inch pots (plastic) that hold about six crocus or 4 or 5 narcissus. I put a small square of plastic screening or nylon net in the bottom. (It helps keep the baby slugs from eating the roots). Fill pot about 1/3 full of good garden soil enriched with bone meal, add a layer of sand, but the bulbs in place, cover with sand and fill to top with ordinary soil mixed with Soildusto. The sand provides drainage and keeps the bulbs healthy. I insert the pot to the brim in the ground in the fall and leave it. After blooming it can easily be lifted, if desired, and replaced by bedding plants. There is no need to transplant yearly. Indeed, many species do far better if left alone for several

years—they seem to resent being moved. After the foliage dies back they should not be watered.

Where can you get these little bulbs? The Arboretum Foundation plant sale to be held on October 2nd will offer many of them. Lists are available at the Foundation office upon request. It is advisable to place advance orders to ensure getting some of the rarer varieties.

Ruby S. Williams (Mrs. W. E.)

There is room in any garden for a few bulbs that may not be as well known as the crocus and daffodil. These will complement the usual varieties and extend the blooming period into the summer.

I am very fond of *Camassia Leichtlinii,* a fairly tall plant with a raceme of very blue flowers like tiny lilies in May. The transition from flower to seed is a rewarding esthetic experience and seeds may be gathered in July or allowed to drop naturally. While slow to germinate they are not difficult to grow from seeds. They like a wet meadow-like area.

Mariposa tulips are easily grown. They like a sandy loam rich in nitrogen and prefer a location with full sun. I plant mine in cans and lift them after blooming and allow them to dry completely in the cans. They may be repotted or simply reset in the fall and divided in a couple of years.

Two of my favorites are *Calochortus luteus* with up to four deep yellow flowers faintly penciled in brown. They bloom in June and are about 1-1½ feet tall. The other is *C. venustus eldorado,* usually white with purple blotches but varies in color and is sometimes yellow or lavender. The flowers are large and upright on wiry stems up to 2 feet tall.

Once you grow these you will be addicted and will want to try some of the other species referred to as Globe tulips and Fairy Lanterns—(*Eucalochortus*).

Phyllis (Mrs. George W.) Zoll

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BOOK REVIEWS

Trees of the Australian Bush. Photographs and text by Eric Worrell and Lois Sourry. Angus and Robertson, Melbourne, 1967.

Photography becomes alive and meaningful through its application in this book. Trees and forests in the United States, from the coniferous evergreens to the North American eastern hardwoods in their autumn glory, have long been subjects of the photographer's art because of their natural attractiveness. This book is designed to show the beauty and variety of Australian trees. One class illustrates forest trees valuable because their stems are suitable for commerce. Another class shows the harshness of the environment of some of the trees, with a pleasing selection of examples. Trees are shown near the timber line on mountain peaks, on the windswept coastline, and in the arid regions of the interior, where trees occur only along a watercourse, or in a favored valley in a rough mountain range. Examples of each are given, with a particularly attractive picture in color of River Red Gum in the "Dry Country." Here the cylindrical form of the tree boles and the symmetry of a flourishing tree in a favoured habitat are replaced by an eccentricity of shape of stems, branches, and crowns. This selection is an art in itself, requiring painstaking study and laborious comparison to achieve the results obtained. A natural tortuous shape, as in the Gimlet Gum of Western Australia, is not overlooked, nor is the historical happening represented in the Old Gum Tree at Glenelg in South Australia where Captain John Hindmarsh, the first governor of the State, read under this tree the proclamation that established South Australia's government on 28th December, 1836.

The really beautiful flowers of many of the Eucalypts are not commonly recognized, and it is pleasing to see color photographs of some Goldfields species included. Publications of this type will lead to a wider appreciation of these flowering trees, and consequent recognition of their value as arboretum species around the world. However, it should be noted that not all Eucalypts are Gums, as is stated in the first sentence of the book. Although the Eucalypts are overwhelming in both numbers and range, the authors have rightly included examples of other trees than Eucalypts. The title of the book is an apt one, for the word "Bush" has been used to signify the forest as well as the outback in some parts of Australia, and in some forests timber workers were termed "bush workers."

The reader will find the trees of this southern land faithfully reproduced in a readily recognizable form, making this a useful reference work. The beauty of the book makes it a suitable item for collectors. The authors, Eric Worrell and Lois Sourry are well prepared to present the work. Dr. Worrell is Director of the Australian Reptile Park in Gosford, and has written several other excellent descriptive books on Australian subjects. Miss Sourry is the author of two school texts on plants, and is well known in educational and conservation work in Australia.

Dr. T. N. Stoate

New Zealand Flowers and Plants in Colour—J. T. Salmon, A. H. & A. W. Reed, Wellington, N.Z.

This book is not only for the dedicated botanist, but also for that vast army of horticultural enthusiasts who, by word and picture, can visit the singularly interesting flora of New Zealand.

The author, Professor J. T. Salmon, is Associate Professor of Biology at Victoria University at Wellington. He has held offices in all of the principal scientific societies in his country.

His early introduction to the art of photography, which he loves as a "medium especially adapted for showing the beauties and intricacies of Nature to the uninitiated," has led to his association with many photographic organizations. The 543 superb colored plates in his book reflect the tremendous amount of patience and artistry of this scientist, as well as his great love of his country's native plants. A true conservationist, he is as concerned as those in our area over man's encroachment upon his environment and the subsequent annihilation of the rare species.

Professor Salmon has divided his subject into the various ecological regions of the country, from seacoast to forest, from scrubland to alpine. He has included not only the scientific names and Families, but the common and Maori names.

It is interesting to note that 75% of the New Zealand species are endemic. We meet a few exotic relatives of the Heath Family—4 **Gaultherias** and a **Pernettya**; 7 relatives of the Rose Family—3 **Rubus**, 3 **Acaena**, and a **Geum**; admirers of the Lily, Orchid, Composite, and **Ranunculus** Families will meet many fascinating new species such as **Ranunculus** lyallii, the breathtaking white "Giant Buttercup"; an extraordinary genus in the **Compositae** is "Vegetable Sheep," **Raoulia**, a peculiar plant forming hard, tight cushions, one species of which reaches 12½ ft. across; a few of the 58 species of **Celmisia (Compositae)** are shown. All but one of these is native only to New Zealand, and that one grows also in Australia and Tasmania. Photographs of the Grasses, Sedges, and Rushes are particularly beautiful.

It is strange that the only conifer genus mentioned is **Podocarpus**. You may see this one in the Arboretum, as well as **Hebe**, **Hoheria** (Lacebark), **Hymenanthera**, **Leptospermum** (Teatree), **Nothofagus** (Beech), **Olearia** (Tree Daisy), and **Senecio** (Groundsel). But what Pacific Northwest layman has heard mention of the **Stylidiaceae** or **Donatiaceae?**

The only hazard in reading this volume is that one's mind becomes firmly resolved that a trip to New Zealand is a "must"

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Street Trees

(*Continued from page 67*)

fail, but under more severe conditions than ours, the blossom may be hit by frost.

Mountain Ash—Sorbus aucuparia

+Attractive in flower, foliage and autumn color. Selected for vigor, robust trunk and general habit, it could be good. This would require growing from a selected clone.

—Trunk often weak and spindly when young.
Fairly susceptible to drought and disease.
Habit variable, some seed sources probably better than others.
Relatively short lived.
Fruit may be bothersome on narrow boulevards.

Cherries—Prunus species

+They are very attractive in blossom in the spring and often give a brief display of good fall colour.

—They only do well on the light to medium soils under good drainage conditions. Susceptible to virus and other diseases and insects. Many lack vigour and hardiness, particularly double Japanese sorts. Most injured at temperature of zero.
Relatively short lived.

BEST CHERRIES:

Yoshino—Prunus yedoensis

+Good vigour and one of hardiest Japanese sort.
Dependable spring show. Best cherry for streets.

—Broad habit; low branches, need frequent attention.

Higan Cherry—Prunus subhirtella

+Select forms have good habit and good display of flowers in spring and fair autumn colour.

—Slow growing. Extremely variable in habit. Grow only from clones. Flowers may be hit by late frost.

Autumn flowering Higan Cherry—P.s.'Autumnalis'

+Nice floral display. Good fall colour. Small tree.
Will flower for five months or more under right conditions, November to April—Much appreciated by public.
Will continue to bloom after light frosts.

—Broad head needs constant lifting. Blooms in fall and winter only under near frost free conditions.

Other very attractive Higan or Japanese Spring Cherries are:
'Fukubana'—double red, and 'Atsumori'—double pink; which make smaller trees and are less hardy.

Sargent Cherry—Prunus Sargentii

A slow growing upright cherry of distinction. It seems resistant to some cherry pests and is hardy.

Kanzan Cherry—Prunus serrulata 'Kanzan'

+This is the common double pink cherry of upright habit.
Hardiest of the double cherries along with 'Mt. Fuji', double white, which is too broad headed for street use.

—Its upright, stiff habit is a bit formal and objectionable.
It looks very thin foliaged at times due

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to factors of virus, brown rot and probably other diseases. When mature the habit becomes more graceful, like that of the American Elm.

Double Gean—Prunus Avium 'Plena'

+A vigorous double form of the fruiting cherry, double white flowers.

—Flowers turn brown when dying, foliage goes thin, as noted above.

Subject to usual pests of cherries.

Anise Magnolia—Magnolia salicifolia

+We grew this from seed.

We have some well shaped trees which have attractive flowers and foliage. It should be good, propagated from select forms.

—It flowers on naked wood in early spring and may be injured by late frosts.

No pests or disease noted.

Laburnum Vossii

+This makes a small tree with attractive, usually sterile, clusters of yellow flowers.

—Grows fast when small, slowly when older. Rather short lived.

May get occasional infestation of aphis, honey dew and sooty fungus.

Amongst the Maples we grow two which show promise but only if grown from select clones.

Red Maple—Acer rubrum

+Fast growing in small stages—open thin headed, good fall colour and red blossoms also attractive.

—May be too large. Our oldest trees are about 15 years.

English Hedge Maple—Acer campestre

+A slow growing tree of moderately small size, good form and habit, yellow fall colour. We like the appearance of the odd old individual specimen around the city.

Because the faults of trees are seldom stressed as much as their virtues, I wish to make a few comments about trees we have discarded for one reason or another. Most of them grow too large. Some of them have splendid characteristics, but for various reasons they are unsuitable.

Spanish Chestnut

Flowers in July. From the time the flowers fall in August, the leaves start dropping and continue for four months into November. Definitely a messy tree.

Linden, lime or bass

Susceptible to aphis, leaf hopper and sucking insects. Honey dew causes sooty mould and drips on cars and sidewalks.

Elms and Maples

The same remarks apply. In addition, Linden and Elm trees drop leaves under our dry conditions from August to mid November.

Horse Chestnuts

While we have some nice streets, their "conkers" are a nuisance. Leaves, however, drop quickly—within two weeks and present no problem. They make massive boles and may heave sidewalks.

Crabapples

Fruit attracts some people in the fall and breakages result. Susceptible to diseases.

Sorbus Aria 'Majestica'

Leaf hoppers are very bad.

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NATIVES

Arbutus Menziesii—Madrona

Leaves fall all summer. It is hard to move, otherwise good.

Dogwood—Cornus Nuttallii

Ideal in appearance, but almost impossible to grow under street conditions. Susceptible to girdling base rot, for which there is no known cure. They are also subject to injury to the trunk by sun scald. I still dream that someone will make a success of using this beautiful tree on streets.

Vine Maple—Acer circinatum

Excellent small tree and fall colour, but lacks vigour under street conditions, and is susceptible to die back. If Dogwood and Vine Maple would grow for us, we would grow them in quantity.

Tulip Tree—Liriodendron tulipifera

Susceptible to die back because of frosted late growth in nursery. Once established on street it becomes a large attractive tree with good green and gold fall colour. We like it. It will make a large tree.

Sweet Gum—Liquidambar styraciflua

Injured by frost in nursery, as cited above. Excellent fall colour. Not easy to establish and somewhat slow in the nursery, but otherwise a first rate tree and tops for colour. Try the new clones.

Poplars, Willows

Most people know that these trees are trouble makers, particularly because of their surface roots.

Conifers and Evergreens

These create a rather heavy effect and in addition drop foliage to a greater or less degree in midsummer. There is also the hazard to consider because of their dense foliage.

Ginkgo

These trees are extremely slow here. This we attribute to our cool summers. (Mean summer temperature 60°), otherwise very attractive and clean. Use male tree.

Katsura-Cercidiphyllum japonicum

+A fibrous rooted tree easily moved, good fall colour under certain conditions.

—Likes more moisture than we can give it. May do well where moisture is available.

London Plane—Platanus acerifolia

+A large tree adaptable and fairly pest free.

—Too big for most streets. Heavy shade cast by large foliage.

Subject to a bacterial leaf blight in recent years. Resistant to adverse downtown conditions.

Upright European Hornbeam—Carpinus Betulus 'Pyramidalis'

+This is a tough tree of good habit and is susceptible to mite injury, otherwise it's first rate. It will do well downtown and will make a quick screen if close planted.

Pirone Little Leaf Ash—Fraxinus angustifolia 'Pirone'

+This is an upright vigorous male clone which is doing well under downtown conditions. We have had Oyster Shell Scale, otherwise no problems.

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In Czechoslovakia, Poland and Hungary, May-June, 1967

(*Continued from page 61*)

in the head I felt in need of it. During the morning I went for a walk down the long and wide street on which this hotel is located (the Leninkorut), which has two lanes of traffic in each direction and street car lines down the center, which are heavily used. Along the edges of the broad sidewalks are young trees, all planted since the last war; I noted the London plane, (*Platanus x acerifolia*), the silver linden (*Tilia tomentosa*), and a species of *Celtis*, probably *C. australis* from S. Europe. Large boat-shaped concrete planter boxes are used at some important intersections to direct pedestrian traffic to their crossings. They were filled with petunias, salvias and other plants for the summer.

The cold took longer to dispose of than anticipated, and it was Tuesday, the 30th, before I was able to take up my program again. My guide here was Mrs. M. Lexa, botanical assistant and artist to Prof. Z. Karpati, of the Academy of Horticulture and Viticulture in Budapest, who spoke excellent English and was acquainted with members of the International Dendrology Society in Europe whom I also knew. Prof. Karpati regrettably had to attend another meeting in Spain at this date.

In the morning we first visited the University Botanical Garden in the city, where the most notable plants were three large *Ginkgo* trees immediately outside the Director's office, and a large specimen of the rare hybrid between *Pyrus* and *Sorbus*, *Sorbopyrus auricularis*. New glasshouses had been completed in 1966, the largest about 45 feet high, and planted with palms and many subtropical plants. There were also good collections of ferns, cacti and bromeliads in other smaller and older houses.

On the following morning, May 31, a car and driver was provided to take me out to the Research Institute and Botanical Garden of the Hungarian Academy of Sciencse at Vacratot, about fifteen miles N.E. of Budapest. The Director is Dr. B. Zolyomi, who received me most cordially. The park, some 50-55 acres in extent, was originally planted from 1872 onwards; there are some fine specimen trees remaining of this age, including honey locust, Kentucky coffee tree, swamp cypress, London plane, the purple-leaved European beech and a fastigiate *Quercus Robur*. Much planting has been done recently, especially of conifers. A stream flows through the property and there are two small lakes.

A garden of plant families, covering perhaps two acres and arranged according to their phylogenetic system, is an unusual and important feature, especially as it can be viewed from a mound. Geobotanical and ecological research work is being carried out; at the time of my visit the original house was being renovated and new laboratories added for research purposes.

We had lunch in Vac, not far away, on the Danube, where there is a magnificent example of a Baroque period church, as well as a number of well preserved 18th century stone houses. During the afternoon we inspected the greenhouses, which contained similar collections to those already seen elsewhere, and finally returned to Budapest about 7:00 p.m. Next day I left by train at 1:40 p.m. en route to Zagreb, in northern Jugoslavia. The wild flowers along the way often made a bright display and some of them were recognizable,—blue cornflower, yellow *Verbascum* about three feet, a purple *Orchis* in wet places, a *Scabiosa*, probably *S. columbaria*, and *Lychnis Flos-cuculi*. The black fruited elder bush, *Sambucus nigra*, was likewise flowering profusely on the edge of woodlands composed of oaks, beech, hornbeam and linden. At the two frontier stations we were delayed 90 minutes in all for inspections of passports and baggage (only on the Hungarian side), so it was nearly 10:00 p.m. when I finally reached my destination, to find Mrs. Mulligan already installed in the Hotel Esplanade. Our tour in Jugoslavia will have to form another chapter, in a future issue of the *Bulletin*.

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The Arboretum Unit Council

ANNUAL FALL PLANT SALE

Wednesday, October 2, 1968
9:00 a.m.

The choicest of Plant Material will be offered —Rhododendrons, Azaleas, Ground Covers, Trees, Shrubs, Ferns, Herbs, Natives, Vines, etc.

Be there early in order to find the best selection

(See Plant List Insert)